CNS-9701A
CNS-9701J
CNS-9701K

CENTRAL MONITOR

CNS-9701

0614-006866D

Model: CNS-9701A/J/K

Manual code no.: 0614-006866D

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GENERAL HANDLING PRECAUTIONS

This device is intended for use only by qualified medical personnel.
Use only Nihon Kohden approved products with this device. Use of non-approved products or in a non-approved manner may affect the performance specifications of the device. This includes, but is not limited to, batteries, recording paper, pens, extension cables, electrode leads, input boxes and AC power.

Please read these precautions thoroughly before attempting to operate the instrument.

1. **To safely and effectively use the instrument, its operation must be fully understood.**

2. **When installing or storing the instrument, take the following precautions:**
   (1) Avoid moisture or contact with water, extreme atmospheric pressure, excessive humidity and temperatures, poorly ventilated areas, and dust, saline or sulphuric air.
   (2) Place the instrument on an even, level floor. Avoid vibration and mechanical shock, even during transport.
   (3) Avoid placing in an area where chemicals are stored or where there is danger of gas leakage.
   (4) The power line source to be applied to the instrument must correspond in frequency and voltage to product specifications, and have sufficient current capacity.
   (5) Choose a room where a proper grounding facility is available.

3. **Before Operation**
   (1) Check that the instrument is in perfect operating order.
   (2) Check that the instrument is grounded properly.
   (3) Check that all cords are connected properly.
   (4) Pay extra attention when the instrument is in combination with other instruments to avoid misdiagnosis or other problems.
   (5) All circuitry used for direct patient connection must be doubly checked.
   (6) Check that battery level is acceptable and battery condition is good when using battery-operated models.

4. **During Operation**
   (1) Both the instrument and the patient must receive continual, careful attention.
   (2) Turn power off or remove electrodes and/or transducers when necessary to assure the patient's safety.
   (3) Avoid direct contact between the instrument housing and the patient.

5. **To Shutdown After Use**
   (1) Turn power off with all controls returned to their original positions.
   (2) Remove the cords gently; do not use force to remove them.
   (3) Clean the instrument together with all accessories for their next use.

6. **The instrument must receive expert, professional attention for maintenance and repairs. When the instrument is not functioning properly, it should be clearly marked to avoid operation while it is out of order.**

7. **The instrument must not be altered or modified in any way.**

8. **Maintenance and Inspection:**
   (1) The instrument and parts must undergo regular maintenance inspection at least every 6 months.
   (2) If stored for extended periods without being used, make sure prior to operation that the instrument is in perfect operating condition.

(3) Technical information such as parts list, descriptions, calibration instructions or other information is available for qualified user technical personnel upon request from your Nihon Kohden distributor.

9. **When the instrument is used with an electrosurgical instrument, pay careful attention to the application and/or location of electrodes and/or transducers to avoid possible burn to the patient.**

10. **When the instrument is used with a defibrillator, make sure that the instrument is protected against defibrillator discharge. If not, remove patient cables and/or transducers from the instrument to avoid possible damage.**

WARRANTY POLICY

Nihon Kohden Corporation (NKC) shall warrant its products against all defects in materials and workmanship for one year from the date of delivery. However, consumable materials such as recording paper, ink, stylus and battery are excluded from the warranty.

NKC or its authorized agents will repair or replace any products which prove to be defective during the warranty period, provided these products are used as prescribed by the operating instructions given in the operator's and service manuals.

No other party is authorized to make any warranty or assume liability for NKC's products. NKC will not recognize any other warranty, either implied or in writing. In addition, service, technical modification or any other product change performed by someone other than NKC or its authorized agents without prior consent of NKC may be cause for voiding this warranty.

Defective products or parts must be returned to NKC or its authorized agents, along with an explanation of the failure. Shipping costs must be pre-paid.

This warranty does not apply to products that have been modified, disassembled, reinstalled or repaired without Nihon Kohden approval or which have been subjected to neglect or accident, damage due to accident, fire, lightning, vandalism, water or other casualty, improper installation or application, or on which the original identification marks have been removed.

In the USA and Canada other warranty policies may apply.

CAUTION

United States law restricts this device to sale by or on the order of a physician.

EMC RELATED CAUTION

This equipment and/or system complies with the International Standard IEC 60601-1-2 for electromagnetic compatibility for medical electrical equipment and/or system. However, an electromagnetic environment that exceeds the limits or levels stipulated in the IEC 60601-1-2, can cause harmful interference to the equipment and/or system or cause the equipment and/or system to fail to perform its intended function or degrade its intended performance. Therefore, during the operation of the equipment and/or system, if there is any undesired deviation from its intended operational performance, you must avoid, identify and resolve the adverse electromagnetic effect before continuing to use the equipment and/or system.

The following describes some common interference sources and remedial actions:

1. **Strong electromagnetic interference from a nearby emitter source such as an authorized radio station or cellular phone:**
   Install the equipment and/or system at another location if it is interfered with by an emitter source such as an authorized radio station. Keep the emitter source such as cellular phone away from the equipment and/or system.

2. **Radio-frequency interference from other equipment through the AC power supply of the equipment and/or system:**
   Identify the cause of this interference and if possible remove this interference source. If this is not possible, use a different power supply.

3. **Effect of direct or indirect electrostatic discharge:**
   Make sure all users and patients in contact with the equipment and/or system are free from direct or indirect electrostatic energy before using it. A humid room can help lessen this problem.

4. **Electromagnetic interference with any radio wave receiver such as radio or television:**
   If the equipment and/or system interferes with any radio wave receiver, locate the equipment and/or system as far as possible from the radio wave receiver.

If the above suggested remedial actions do not solve the problem, consult your Nihon Kohden Corporation subsidiary or distributor for additional suggestions.

The CE mark is a protected conformity mark of the European Community. The products herewith comply with the requirements of the Medical Device Directive 93/42/EEC.

The CE mark only applies to the CNS-9701K series central monitors.

This equipment complies with EUROPEAN STANDARD EN-60601-1-2 (1993) which requires EN-55011, class A. Class A EQUIPMENT is allowed in domestic establishments when used under the jurisdiction of a health care professional.

In IEC 60601-1-2 Medical Electronic Equipment, Part 1: General Requirements for Safety, 2. Collateral Standard: Electromagnetic compatibility-Requirements and test. Section 36. 202. 2 Radiated radio-frequency electromagnetic fields, PATIENT COUPLED EQUIPMENT and/or SYSTEMS applicable IMMUNITY test methods are under consideration at SC62A/WG13. The 3 V/m IMMUNITY level may be inappropriate especially when measuring SpO_2 because physiological signals can be much smaller than those induced by a 3 V/m electromagnetic field.

When measuring SpO_2, various interference may produce false waveforms which look like pulse waveforms. SpO_2 value and pulse rate may be measured from these false waveforms, causing the alarm to function improperly.

When installing the monitor, avoid locations where the monitor may receive strong electromagnetic interference such as radio or TV stations, cellular phone or mobile two-way radios.

Conventions Used in this Manual and Instrument

Warnings, Cautions and Notes

Warnings, cautions and notes are used in this manual to alert or signal the reader to specific information.

WARNING

A warning alerts the user to possible injury or death associated with the use or misuse of the instrument.

CAUTION

A caution alerts the user to possible injury or problems with the instrument associated with its use or misuse such as instrument malfunction, instrument failure, damage to the instrument, or damage to other property.

NOTE

A note provides specific information, in the form of recommendations, prerequirements, alternative methods or supplemental information.

Explanations of the Symbols in this Manual and Instrument

The following symbols found in this manual/instrument bear the respective descriptions as given.

On MU-971RA/RJ/RK central monitor main unit

Symbol	Description	Symbol	Description
	Power ON		Hard disk lamp
	Power OFF		Reset
	Attention, consult operator's manual		Mouse socket
	System start/shutdown		Keyboard socket
	Power lamp (Power ON)		(Only for CNS-9701K) The CE mark is a protected conformity mark of the European Community. The products herewith comply with the requirements of the Medical Device Directive 93/42/EEC.

On Screen

Symbol	Description	Symbol	Description
	Overview		Adjust setting/Scroll data
	Help		Alarm
	Print Stop		Speaker
	Delayed recording start		Electrocardiogram
	Print mark/Print		Alarm suspend/silence with remaining minutes at the central monitor
	Menu (System Setup)		Alarm suspend at the transmitter
	Previous		All alarm off, vital sign alarm off
	All Beds		Alarm recording off
	Deletion mark		QRS sync mark
	Close a window		

On VL-971R/RK LCD unit

Symbol	Description	Symbol	Description
	“On” only for a part of instrument		Attention, consult operator’s manual
	“Off” only for a part of instrument		

On WS-971R Recorder Unit

Symbol	Description	Symbol	Description
	Power on		Fuse
	Power off		Type B applied part

For the symbol marks on the locally purchaced LCD display, laser printer and UPS, refer to each instruction manual.

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Introduction

The CNS-9701A/J/K Central Monitor is designed for use in various hospital environments, including the ICU, CCU, recovery room, and general ward. The central monitor allows hospital staff to monitor patient's vital signs and waveforms, along with other patient information.

You can compose a patient monitoring network with central monitors, bedside monitors, multi-patient receivers and transmitters. One network can include up to 300 beds. A patient's data can be accessed simultaneously at up to four central monitors. The system offers monitoring flexibility to best meet your patient's clinical needs. A single central monitor can continuously monitor up to 8 beds (12 beds when the QP-971P 12 Patient Expansion Program Kit is installed and 16 beds when both the QP-971P 12 Patient Expansion Program Kit and QP-972P 16 Patient Expansion Program Kit are installed).

The overview bed function allows you to temporarily monitor a bed that is on the network but not continuously monitored by the central monitor. This provides quick and easy access to any patient's data similar to being monitored at the central monitor.

The central monitor has various windows to monitor a patient's status:

- Monitoring screen
  - Wave Display window
  - ECG 12 Lead Display window
  - All Vital Signs window
- Review window
  - Trend window
  - Tabular Trend window
  - Hemodynamics window
  - Arrhythmia Recall window
  - ST Recall window
  - Full Disclosure window
  - ECG 12 Lead Analysis window
  - Alarm History window

The central monitor provides various types of recordings. Both a thermal array recorder and a laser printer can be used.

Alarm limits and other bedside monitor settings can be set or changed remotely from a central monitor.

Please read this manual thoroughly before operation in order to obtain full use of the central monitor. Also read the manuals for the bedside monitors, transmitters and multi-patient receiver.

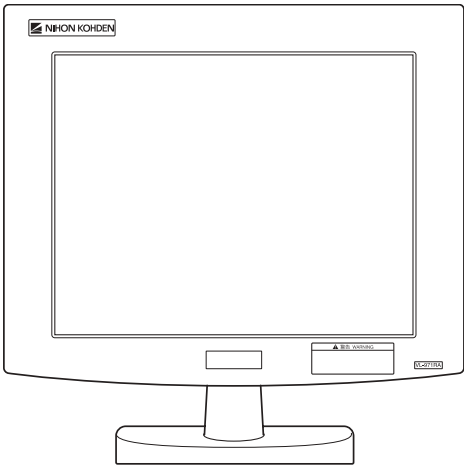
NOTE

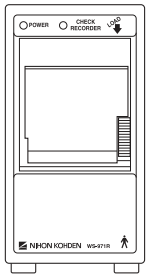
Use Nihon Kohden parts and accessories to assure maximum performance from your instrument.

For simplicity, the suffix A/J/K will be omitted in this manual. There is no difference in operation among models with different suffixes unless otherwise specified.

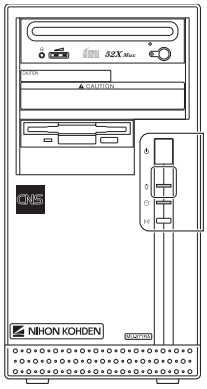
Central Monitor Composition

VL-971R/RK LCD Unit

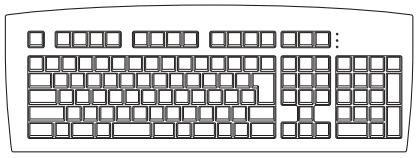




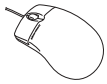
WS-971R recorder unit



MU-971RA/RJ/RK
central monitor main unit

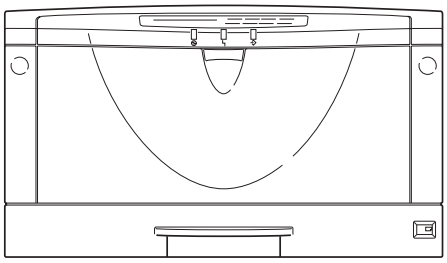


Keyboard

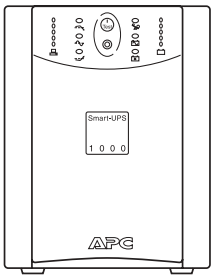


Mouse

QP-971P/972P/973P/974P
program kit



Laser printer
(Network printer)



UPS

Display selection:

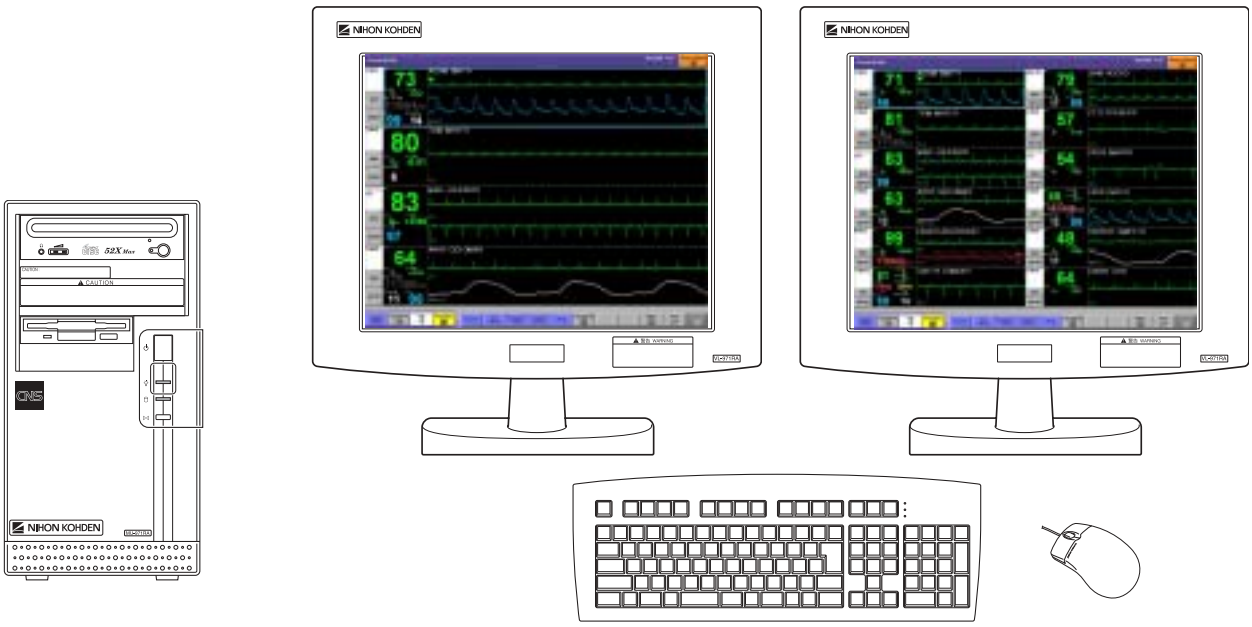
Besides the VL-971R/RK LCD Unit, an LCD display recommended by Nihon Kohden can also be used. For details, refer to the CNS-9701 installation guide.

Dual Display Monitoring

Monitoring with dual displays is available. For example, with two displays connected to one central monitor, you can display 16 patients, 8 patients on each display, or you can set both displays to All Bed screen or one display to Expand Individual Bed screen.

For the setting of the number of monitored beds or Expand Individual Bed screen, refer to Section 4 “Monitor Setting”.

For the Windows settings necessary when using dual displays and connection procedure, refer to the CNS-9701 installation guide.

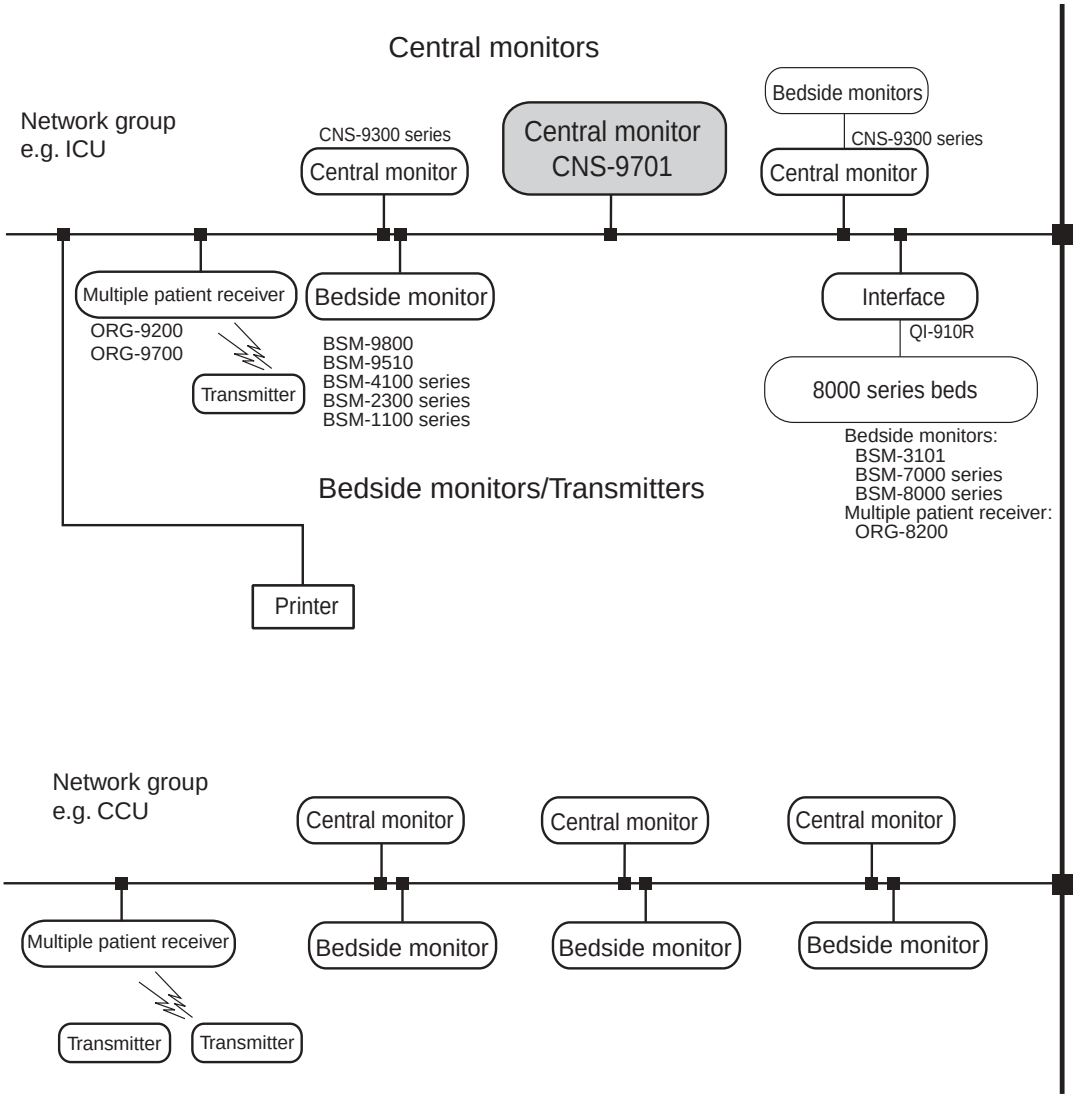


Network Composition

In a central monitor network, on a central monitor, you can see data of any bed in the network. On a bedside monitor, you can see data of any bed in the network using the interbed function.

The data that can be displayed on the bedside monitor or central monitor depends on the type of bedside or central monitor used.

The number of central monitors and bedside monitors that can be connected to a central monitor network and the method of network communication depend on the type of monitor used. For details, refer to the Network and System installation guide.



WARNING

- **Install the printer and hubs outside the patient environment (IEC 60601-1-1 2.204). If they are installed inside the patient environment, the patient or operator may receive electrical shock.**
- **Check the software version number of the monitor before connecting it to the network. Different software versions have different communication methods. When there is more than one communication method in the network, communication may malfunction.**

Operation Restriction by Monitored Bed Type

What the central monitor can do depends on the monitored bed type.

Alarm function

Monitored Bed Type	Alarm Function		
	Temporarily silence/suspend alarms	Turning alarm On/Off	Priority
BSS/BSM series bedside monitor	Temporarily silence any current alarms.	Not available When all alarms are set to OFF on the bedside monitor, the alarm function is OFF on the central monitor.	The alarm priority at the central monitor coincides with the alarm priority at a bedside monitor.
ORG-9200/9700 multiple patient receiver with transmitter		Not available	
BSM series bedside monitor via QI-910R interface	Temporarily suspend all alarm functions	Not available When all alarms are set to OFF on the bedside monitor, the alarm function is OFF on the central monitor.	The alarm priority at the central monitor does not coincide with the alarm priority at the bedside monitor.

ST Recall window

Monitored Bed Type	ST Recall File	
	Save	Contents of the file
BSS/BSM series bedside monitor	Saved at set intervals. (You can set the interval.)	• Date and time when the data was saved • Heart rate when the data was saved • Maximum 12 lead ST waveform (Averaging 15 seconds ECG waveform)
ORG-9200/9700 multiple patient receiver with transmitter		
BSM series bedside monitor via QI-910R interface	Not available	Not available

Parameter Setup/Personal Setup/Setup

Monitored Bed Type	Personal Setup	
	Alarm settings	Other settings
BSS/BSM series bedside monitor	The settings at the bedside monitor and central monitor are synchronized. Changing one changes the other.	Some of the setting items that can be set on the bedside monitor can also be set on the central monitor.
ORG-9200/9700 multiple patient receiver with transmitter	Can be set on the central monitor	All setting items can be set on the central monitor.
BSM series bedside monitor via QI-910R interface	The settings at the bedside monitor and central monitor are synchronized. Changing one changes the other.	Some of the setting items that can be set on the bedside monitor can also be set on the central monitor.

NOTE

BSM in the table includes bedside monitors that receive or display data from a transmitter connected to the patient.

Operation Restriction Depending on Whether Data Is Stored in the Central Monitor

When registering a patient as a monitored bed, you need to select whether or not the patient's data is saved in the central monitor. Some operations are not available on beds whose data is not saved in the central monitor.

Operations only available when data is saved in the central monitor

Admit/Discharge window	• Admit* • Discharge/Data deletion • Temporary discharge • Patient transfer
Channel window	Setting a receiving channel
Full disclosure window	Selecting saved waveforms
Arrythmia recall window	Deleting a recall file
ECG 12 Lead Analysis window	Deleting analysis result files
Alarm History window	Displaying the list of all alarms
Report window	Automatic report recording
Recording	Remote recording requested from bedside monitors

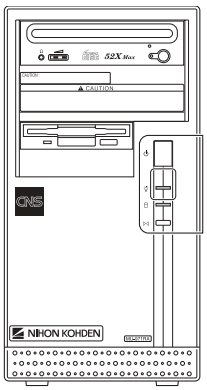
* You can enter and edit patient data for an admitted bed whose data is not saved in the central monitor.

Monitored Bed

A monitored bed is a bed which is registered on the Monitor Setting window of the System Setup and is continuously monitored at the central monitor.

Expand Individual Bed Screen

You can monitor with dual displays and set both displays to All Bed screen or one display to Expand Individual Bed screen.
This setting is at “Expand Individual Bed screen” at “Display Setting” in “Monitor Setting” of the System Setup screen.



Specific Functions of Expand Individual Bed screen

You can operate the Expand Individual Bed screen the same as the All Beds screen/ Individual Bed screen except for the following differences.

Display/Screen		Items	Regular Screen	Expand Indiv. Bed Screen
Individual Bed Screen	Wave Display	Number of waveform traces	8 traces max	11 traces max
		Number of numeric data	11 data max	13 data max
Basic Information area		---	Available	Not available
Review Window	Trend	Number of parameters	4 parameters max (2 frames)	6 parameter max (3 frames)
		Number of events	2 events max	6 events max
	Tabular Trend	Number of parameters	18 rows max	30 rows max
	Hemodynamics List	Number of parameters	17 rows max	26 rows max
		Blood pressure S/D/M	Display in one row	Display in each row
	Arrhythmia Recall	Number of arrhythmia recall files	11 files max	18 files max
		Number of expanded arrhythmia recall waveforms	1 file max	Single waveform display: 3 files max Multiple waveform display: 1 file max
	ST Recall	Number of leads	3 leads max	6 leads max
	Full Disclosure	Time length on the compressed waveform display	12 min max	30 min max
	ECG 12 Lead Analysis	Display types	Switch to display Tabular Trend/ Zoom In Display/ Comparison Display/ Analysis Report.	Tabular Trend/ Analysis Report are regularly displayed. Switch to display Zoom in Display/ Comparison Display.
		Printing	Differs depending on the display type.	
	Alarm History	Number of alarms	15 alarms max	25 alarms max

Types of Windows

All Beds screen

4 patients (2 waveforms)

6 patients (2 waveforms)

8 patients (2 waveforms)

12 patients (2 waveforms)

16 patients (1 waveform)

Overview Bed Menu window

Menu window

Individual Bed screen

Wave Display window

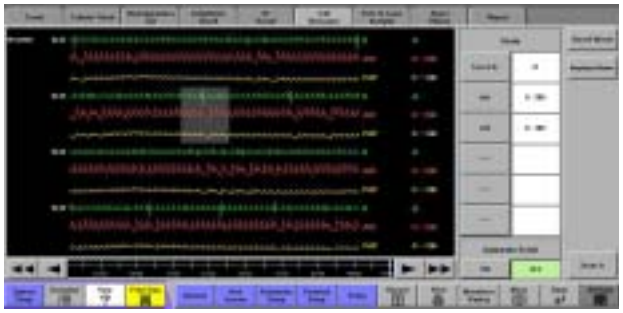
ECG 12 Lead Display window

All Vital Sign window

Review windows

Report window

ECG 12 Lead Analysis window

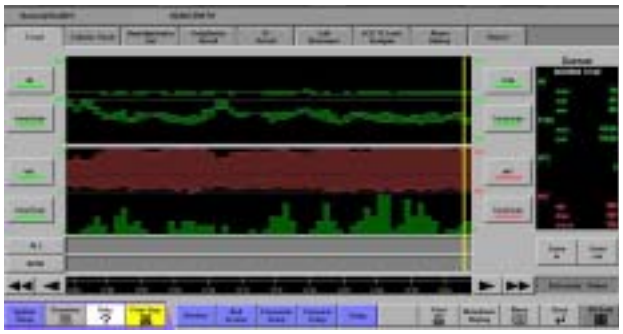


Full Disclosure window

ST Recall window

Arrhythmia Recall window

Tabular Trend window



Trend window

Alarm History window

System Setup

Setup

Personal Setup

Parameter Setup

Basic Operation

Control and Input

The operation of the central monitor is controlled through the touchscreen, mouse, and keyboard.

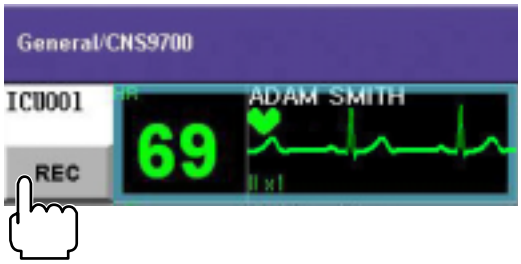
- When using the VL-971R/RK LCD Unit, you can use the touchscreen function. You can also use the optional keyboard and mouse.
- When using a Nihon Kohden recommended LCD display, operate with the keyboard and mouse.

This manual explains operations assuming that the touchscreen function is used.

Touchscreen Input

When using the VL-971R/RK LCD Unit, you can operate the central monitor through the touchscreen. To operate, directly touch an area of the screen with your finger. In this manual, directly touching the XX key on the screen with your finger is referred to as “Touch ‘XX’.”.

Example: Touch “REC”.



On any screen where text entry is required, you can use the on-screen keyboard as you would an actual keyboard.

Keyboard Input

From the keyboard, you can input letters and numbers. You can also select an item and scroll data with the arrow keys on the keyboard. In this manual, pressing the XX key on the keyboard is referred to as “Press the XX key”.

Mouse Input

Mouse input is also available throughout the screens. Click items and menus on the screen to select them. This technique has basically the same effect on screen operations as the touchscreen input.

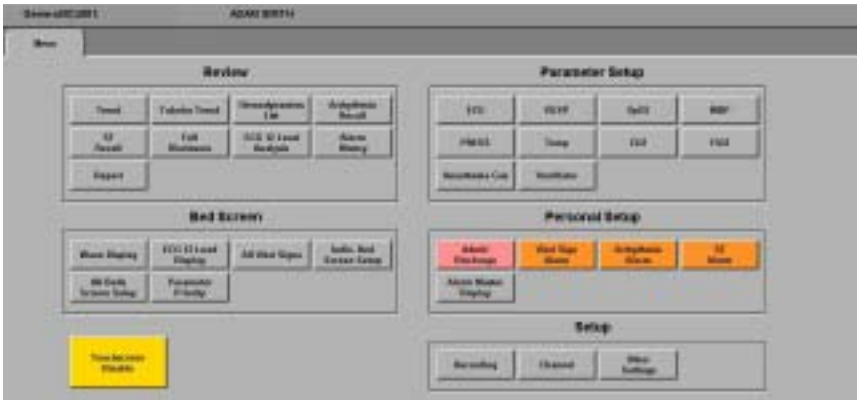
NOTE

The right mouse button has no function.

Switching Windows

Opening other windows from the Menu screen

To display the Menu screen, touch “Menu”. The Menu screen has all keys to open all windows.



Returning to the All Beds screen

Touch “All Beds” on the bottom right of the screen.

Returning to the previous screen

Touch “Back”. Every time you touch this key you can return to the previous screen until you select another bed.

Opening the Individual Bed screen from the All Beds screen

Touch the wave area of the patient you want to display the Individual Bed screen for.

Changing the bed to display or change settings

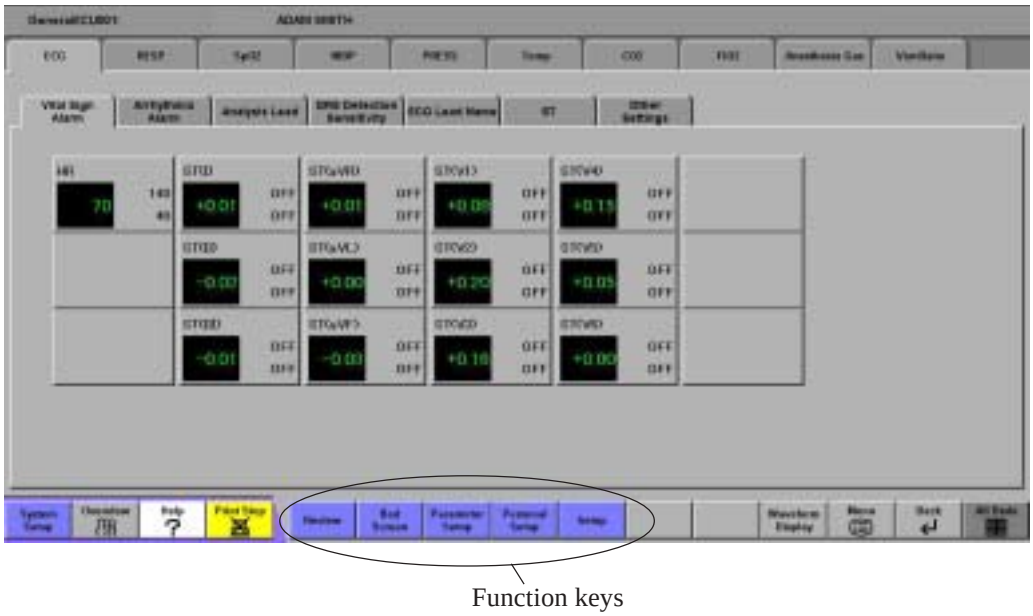
Touch the basic information area of the patient you want to choose.

Opening other windows with tabs

On the Individual Bed screen, windows of the Parameter Setup, Personal Setup and Setup, you can switch the window types by touching the tab of the window name you want to open.

Opening other windows with function keys

When the window is registered in the customized keys, you can also open the window with the function keys.



Changing Settings

Touch the setting on the screen. This can select and unselect and display the setting window for the item.

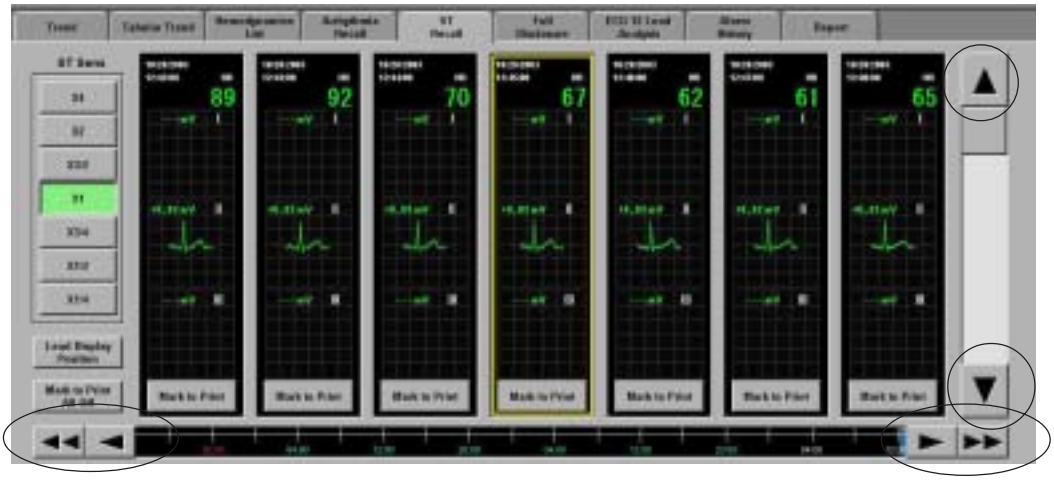
Touch to change selection/non-selection.

According to the touched key, the corresponding setting list appears.

Touch “NONE” to unselect all items.

Scrolling Data and List

Touch arrow keys to scroll data up and down or left and right. You can also scroll with the arrow keys on the keyboard.



Entering Letters and Numbers

Enter letters and numbers from the keyboard on the screen.

You can also increase or decrease a setting value by touching "▲" or "▼" on the screen.

Basic Keyboard Operation

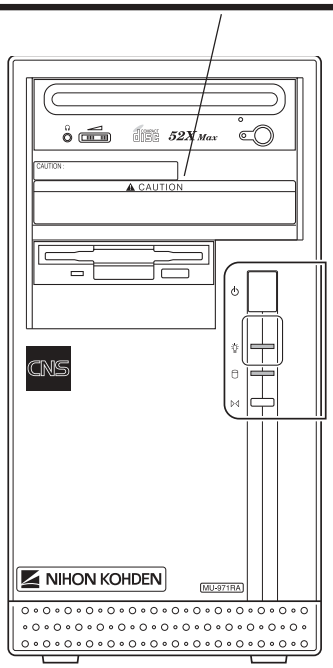
When the touch function keyboard is displayed on the screen, you can also input letters and numbers from the keyboard. You can also scroll data with the arrow keys on the keyboard.

Caution Label and Caution Mark

Central Monitor Main Unit

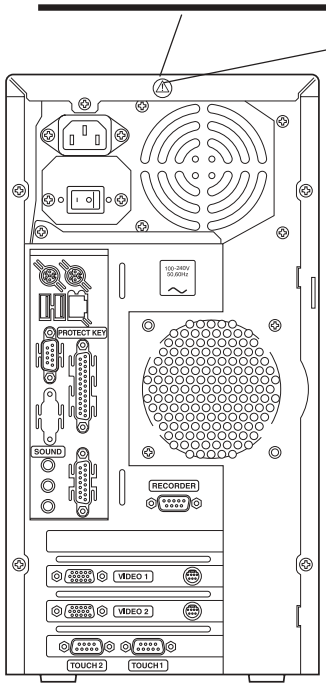
CAUTION

Follow the specified procedure to turn off the central monitor. Otherwise, patient data will be deleted and data in the hard disk and the hard disk itself may be damaged.



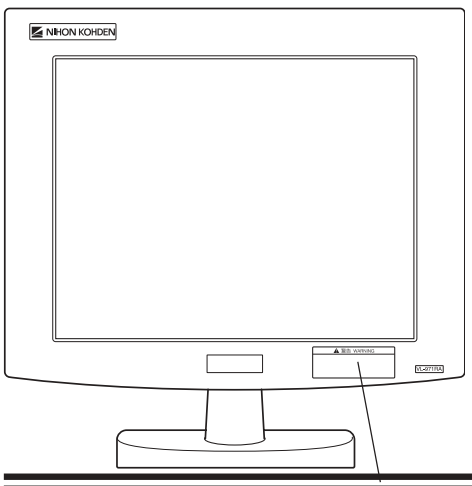
CAUTION

While the central monitor is on, do not touch unused sockets. Failure to follow this caution may damage the monitor by static electricity and may cause malfunction.



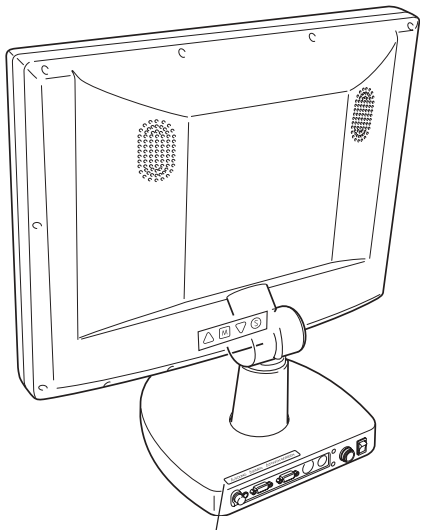
WARNINGs and CAUTIONs about all sockets on the rear panel
Refer to Section 3.

VL-971R/RK LCD Unit



WARNING

Do not turn off the display to which the sound cable is connected. Otherwise there is no alarm sound.



WARNINGs and CAUTIONs about all sockets on the rear panel
Refer to Section 3.

Important Safety Information

General

WARNING

- **Never use the central monitor in the presence of any flammable anesthetic gas, concentrated oxygen or hyperbaric oxygen. Failure to follow this warning may result in explosion.**
- **Never use the central monitor in a high-pressure oxygen medical care tank. Failure to follow this warning may cause explosion or fire.**
- **Do not install any software other than specified by Nihon Kohden and run it in the central monitor. Otherwise Nihon Kohden does not warrant normal operation of the CNS-9701 system program.**
- **Do not install the CNS-9701 system software into a personal computer which is not specified by Nihon Kohden and use it for monitoring.**
  - **If the personal computer does not satisfy the performance specifications which are required by Nihon Kohden, the system software may not function normally.**
  - **If the personal computer does not satisfy the safety standards which are required by Nihon Kohden, the patient and operator may get electrical shock through another instrument in the network.**
- **While the central monitor is on, do not insert any CD-ROM or floppy disk into it. Nihon Kohden does not warrant the normal operation of the central monitor in the case that an application or software installation starts automatically.**

CAUTION

- **If any liquid might have gotten into the central monitor, take it out of service and contact your Nihon Kohden distributor or representatives.**
- **While the central monitor is on, do not touch unused sockets. Failure to follow this caution may damage the monitor by static electricity and may cause malfunction.**

Installation

WARNING

Install the central monitor and external instruments outside the patient environment (IEC 60601-1-1 2.204). If they are installed inside the patient environment, the patient or operator may receive electrical shock. For installation, contact your Nihon Kohden distributor or representative.

CAUTION

- **Only use the provided power cord. Using other power cords may result in electrical shock or other injury to the patient and operator.**
- **Before connecting or disconnecting instruments, turn each instrument off and disconnect each power cord from the AC socket. Failure to follow this caution may cause electrical shock.**
- **Connect only the specified instruments to the central monitor by following the specified procedure. Otherwise, electrical leakage current may harm the patient and operator.**
- **Do not let connection cables stick out; run them along the floor or wall. If people trip over the cable, the monitor may tip over and it may cause injury.**

UPS

WARNING

- **Install the UPS outside the patient environment (IEC 60601-1-1 2.204). If it is installed inside the patient environment, the safety standards which are required by Nihon Kohden are not satisfied and it may cause electrical shock to the patient or operator.**
- **Use a UPS which satisfies the safety standards specified by IEC and UL. Otherwise, lack of safety may cause electrical shock to the patient or operator.**
- **Periodically check the life of the UPS battery. Replace the battery when the lifetime expires. If the battery is used beyond its lifetime, liquid leakage, smoke, fire or explosion may occur.**

CAUTION

- **Make sure that the UPS is properly grounded. Otherwise the operator may receive electrical shock.**
- **To assure an uninterrupted power supply, we recommend using the specified UPS. A sudden loss of power supply or an extreme power surge can damage the central monitor and delete stored data.**

Network

WARNING

- **Connect the central monitor to the network as specified in the Network and System Installation Guide. Otherwise the patient and operator may get electrical shock or other injury. For connecting the network, contact your Nihon Kohden distributor or representatives.**
- **Check the software version number of the monitor before connecting it to the network. Different software versions have different communication methods. When there is more than one communication method in the network, communication may malfunction.**
- **Install the external instruments including the printer and hubs outside the patient environment (IEC 60601-1-1 2.204). If they are installed inside the patient environment, the patient or operator may receive electrical shock. For installation, contact your Nihon Kohden distributor or representatives.**

CAUTION

- **Network settings and Windows 2000 system settings must only be set by a qualified service personnel. Contact your Nihon Kohden distributor or representatives.**
- **The network must be managed by the network administrator. Make sure that each monitor in the network has a different IP address. Otherwise, data communication cannot be performed properly and it causes incorrect monitoring. When adding a monitor to an already operating network, set the IP address on the monitor before connecting the monitor to the network.**

Turning the Power On/Off

WARNING

- **Do not turn off the display to which the sound cable is connected. Otherwise there is no alarm sound.**
- **When monitoring with two displays, do not turn off either display. Otherwise some monitored beds cannot be monitored.**

CAUTION

- **Follow the specified procedure to turn off the central monitor. Otherwise, patient data will be deleted and data in the hard disk and the hard disk itself may be damaged.**
- **After turning the power on, confirm that there is a test sound from the built-in speaker of the display.**

Discharge and Receiving Channel Change

WARNING

- **Check that the channel number of the appropriate transmitter is displayed on the central monitor screen. Otherwise data of a different patient will be monitored or no signal will be received by the central monitor.**
- **Do not use the same channel for different patients. Otherwise two patients' data will be lost due to mutual modulation interference or another patient's data may appear on the monitor screen.**

CAUTION

- **When admitting a new patient, first delete all data of the previous patient. Otherwise, the data of the previous patient and new patient will be mixed together and cause misunderstanding of the patient history.**
- **When you change the receiving channel to monitor a new patient, first delete all data of the previous patient. Otherwise, the data of the previous patient and new patient will be mixed together and cause misunderstanding of the patient history.**

Temporary Discharge

WARNING

When a temporarily discharged patient comes back, resume monitoring for the patient. During temporary discharge, there is no display of measurement values, alarm function and data saving.

Patient Transfer

CAUTION

- **Keep the original bedside monitor and the destination bedside monitor power on and connected to the network until the transfer completes. Otherwise transfer fails and the data is lost. After transfer, confirm that the data was correctly transferred to the destination bedside monitor.**
- **When the patient is transferred more than once between different central monitors in the network, the data saved on the original central monitor is deleted.**

Alarm

WARNING

- **Do not adjust the sound volume at the display unit. If you decrease the display unit volume to the minimum, there is no alarm sound.**
- **When the Alarm Suspend key on the transmitter is pressed, all alarm functions for the patient are suspended.**
- **Even if the alarm is set to ON, there is no arrhythmia alarm when arrhythmia analysis is turned OFF at the bedside monitor and/or central monitor.**
- **Before you start monitoring a new patient, confirm alarm settings. Alarm settings return to Alarm Master 1 settings when a bed is discharged or a receiving channel is changed.**
- **Securely connect the sound cable. There is no sound if the cable comes off.**

CAUTION

- **When the upper or lower alarm limit is set to OFF, there will be no upper or lower alarm for that limit. When it is set to OFF, frequently observe the patient.**
- **Alarm does not occur for an arrhythmia whose alarm is set to OFF. There is no indication that the alarm is set to OFF. Be careful when you set the alarm to OFF.**

ECG Monitoring

CAUTION

- **If there is any doubt about the arrhythmia analysis, make the central monitor relearn the patient's VPC. Otherwise, an important arrhythmia may be overlooked.**
- **The central monitor does not perform ECG analysis. Therefore, the QRS sound at the central monitor may not synchronize with patient's actual QRS when complicated arrhythmias occur or during pacing.**
- **The ST level transmitted from a transmitter is not designed to be accurate enough for diagnosis. Do not rely on the ST level displayed on the central monitor.**
- **The QRS sound at the central monitor has a delay of approximately several seconds because of network connection.**
- **When the full disclosure waveform is expanded to actual size, it may be distorted because it has been compressed then expanded. When reading the expanded ECG waveforms, be aware of this distortion.**
- **Turn the pacing detection to ON when monitoring a pacemaker patient. Otherwise QRS and pacemaker spike may not be distinguished and pacemaker failure may not be recognized.**

NIBP Measurement

WARNING

- **When performing long term measurements at intervals less than 2.5 minutes, periodically check the state of the patient, blood vessels and limb for adequate circulation. Congestion may occur at the measurement site.**
- **When performing periodic measurements for a long term, periodically check the circulation condition.**

CAUTION

Before you remotely start and stop NIBP measurement from the central monitor, confirm the state of the patient at the bedside monitor. Carefully start and stop NIBP measurement from the central monitor.

Maintenance

CAUTION

- **Before maintenance (inspection, cleaning, disinfection), turn the central monitor power off and disconnect the power cord from the AC outlet. Otherwise the operator may receive electrical shock or the central monitor may malfunction.**
- **Do not disassemble or repair the central monitor. Disassembly and repair must be performed by qualified service personnel.**
- **Software upgrade must only be done by qualified service personnel or a person with technical knowledge. If upgrade is not done correctly, the central monitor may freeze.**
- **Do the regular inspection according to the cycle specified by Nihon Kohden. Otherwise, deterioration and loss of function are overlooked and it results in incorrect monitoring.**
- **Restart the central monitor once every three months. Otherwise the operation becomes unstable and monitoring may stop. During restarting, patients monitored by the central monitor must be monitored by another instrument.**
- **Replace the hard disk once every two years. If the hard disk gets damaged, monitoring is incorrect and all data saved in the central monitor is lost.**

For the VL-971R/RK LCD unit

- **Follow your hospital regulations to handle blood or bodily fluids on the display.**
- **Be careful not to let any liquid get inside the display.**

Section 2 Panel Description

Central Monitor Main Unit MU-971RA/RJ/RK 2.1
- Front Panel 2.1
- Rear Panel 2.2

LCD Unit VL-971R/RK 2.3
- Front 2.3
- Rear 2.3

LCD Unit (Locally Purchased Recommended Display) 2.4
Recorder Unit WS-971R 2.5
Laser Printer (Network Printer) 2.5
UPS 2.6

Central Monitor Main Unit MU-971RA/RJ/RK

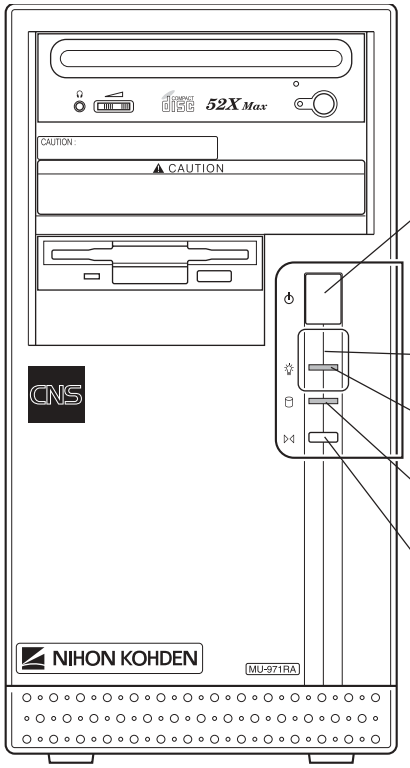
WARNING

While the central monitor is on, do not insert any CD-ROM or floppy disk into it. Nihon Kohden does not warrant the normal operation of the central monitor in the case that an application or software installation starts automatically.

CAUTION

While the central monitor is on, do not touch unused sockets. Failure to follow this caution may damage the monitor by static electricity and may cause malfunction.

Front Panel



Power switch
Turns main unit on or off when the main power switch on the rear panel is on (|).

Power switch cover
For attaching, refer to CNS-9701 installation guide.

Power lamp
Lights when the power is on.

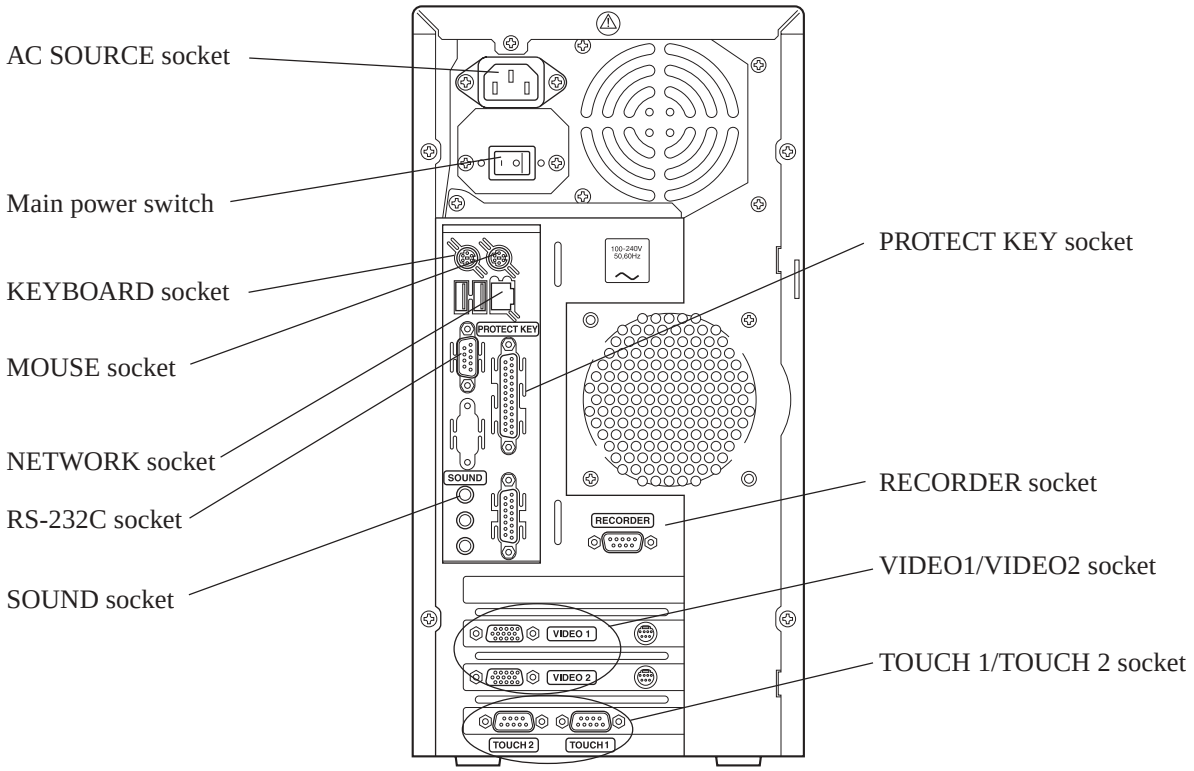
Hard disk lamp
Lights when the hard disk is being accessed.

Reset switch
Normally not used.

Rear Panel

NOTE

- **Do not remove the covers from the unused sockets on the rear panel of the central monitor main unit.**
- **Do not touch the sockets on the rear panel of the main unit or cables around the sockets. Otherwise, static electricity may cause malfunction of the monitor.**



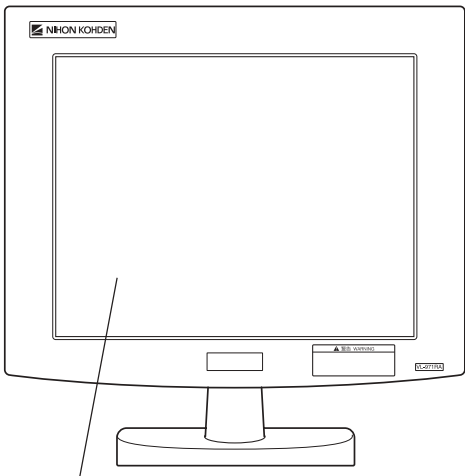
Name	Description
AC SOURCE socket	Connects to a UPS via the power cord provided with the central monitor main unit.
Main power switch	Turns on or off to supply power to the main unit. Under normal conditions keep this switch turned on (|).
KEYBOARD socket	Connects to the keyboard.
MOUSE socket	Connects to the mouse.
NETWORK socket	Connects to network system via a network cable.
RS-232C socket	Connects an instrument to receive or send serial data.
SOUND socket	Connects to the SOUND socket on the display.
PROTECT KEY socket	Connects to the blue protection key (standard accessory of the central monitor main unit) via the connection cable (standard accessory of the central monitor main unit). You must connect the blue protection key to start the system. When using optional QP-971P/972P/973P/974P program kits, connect white protection keys for the program kits to the blue protection key.
RECORDER socket	Connects to the WS-971R recorder unit via the recorder cable provided with the central monitor main unit.
VIDEO1/VIDEO2 socket	Connects to the VIDEO socket on the LCD unit via the RGB connection cable provided with the VL-971R/RK LCD unit.
TOUCH 1/TOUCH 2 socket	Connects to the TOUCHSCREEN socket on the LCD unit via the touchscreen connection cable provided with the VL-971R/RK LCD unit.

LCD Unit VL-971R/RK

WARNING

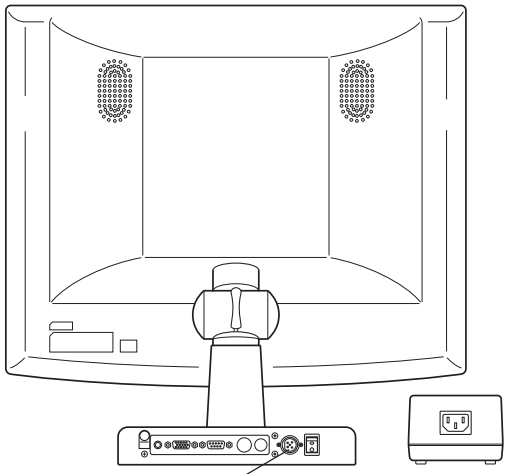
Do not turn off the display to which the sound cable is connected. Otherwise alarm sound does not occur.

Front



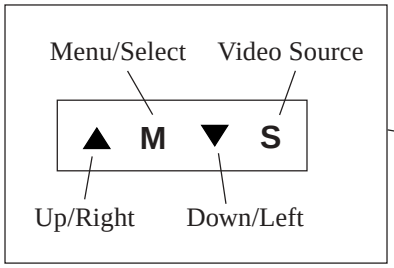
Touchscreen display

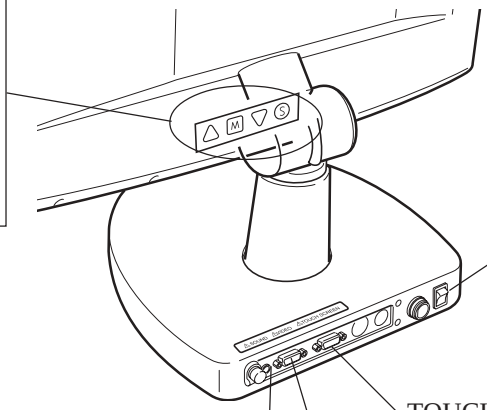
Rear



DC IN socket
Connects to the AC adapter cord.

AC adapter (100 to 240V)
Connects to a UPS via the power cord provided with the VL-971R/RK LCD unit.





Power switch
Turns on (⊙) or off (◯) the LCD unit. Under normal conditions keep this switch turned on.

TOUCHSCREEN socket
Connects to the TOUCH 1/TOUCH 2 socket on the central monitor main unit via the touchscreen connection cable provided with the LCD unit.

SOUND socket
Connects to the SOUND socket on the central monitor main unit via the sound cable provided with the central monitor.

VIDEO socket
Connects to the VIDEO1/VIDEO2 socket on the central monitor main unit via the RGB connection cable provided with the LCD unit.

LCD Unit (Locally Purchased Recommended Display)

WARNING

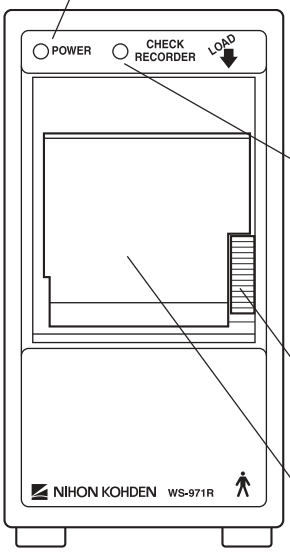
- **Do not turn off the display to which the sound cable is connected. Otherwise alarm sound does not occur.**
- **Do not adjust the sound volume at the display unit. If you decrease the volume to the minimum, there is no alarm sound.**

For the specifications that Nihon Kohden recommends, refer to “Local Purchase Units” in Section 1. Read the display manual together.

Recommended LCD display: NANAO FlexScan L565

The recommended model may be changed without notice. Contact your Nihon Kohden distributor or representative when you locally purchase a display.

Recorder Unit WS-971R

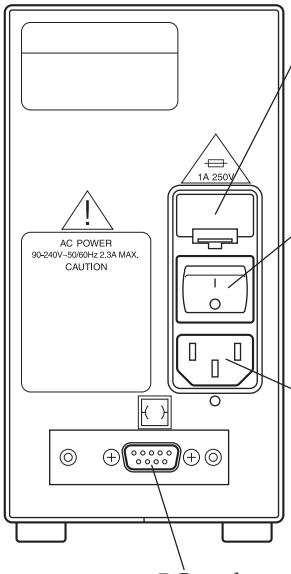


POWER lamp
Lights when the power is on.

CHECK RECORDER lamp
Lights when communication between the recorder unit and central monitor is disconnected or when there is abnormality in the recorder unit.

Paper magazine release lever
Press to open the magazine.

Paper magazine
Contains the recording paper.



Fuse holder
Two fuses (1A) are contained. Fuse must be replaced by qualified service personnel.

Power switch
Turns the power ON (|) or OFF (○).
Usually, keep the power ON.

Power socket
Connects to a UPS with a power cord provided with the central monitor main unit and supplies power (100 to 240V) to the recorder unit.

PC socket
Connects to the RECORDER socket on the rear panel of the central monitor main unit with the recorder cable provided with the central monitor main unit.

Laser Printer (Network Printer)

Use the laser printer that Nihon Kohden recommends. Connect to the network when you use the network printer. Refer to the printer manual together.

Recommended laser printer: Hewlett Packard, LaserJet 4100n
Hewlett Packard, LaserJet 4200n

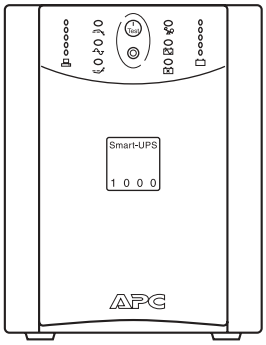
The recommended model may be changed without notice. Contact your Nihon Kohden distributor or representative when you locally purchase a laser printer.

UPS

WARNING

- **Periodically check the lifetime of the UPS battery. Replace the battery when the lifetime expires. If the battery is used beyond its lifetime, liquid leakage, smoke, fire or explosion may occur.**
- **Make sure that the UPS is properly grounded. Otherwise the operator may receive electrical shock.**

Recommended UPS: American Power Conversion, Smart UPS
CNS-9701A/J SUA1000
CNS-9701K SUA1000I



The recommended model may be changed without notice. Contact your Nihon Kohden distributor or representative when you locally purchase a UPS.

Read the UPS manual together.

We recommend using the specified UPS. However, if the recommended UPS cannot be acquired, use a UPS which satisfies the following specifications.

- It has an equipotential grounding terminal.
- The output wave is a sine wave. (When the output wave is a square wave, the AC voltage may become lower due to the AC filter.)
- Inverter type. (With a switch type, noise may interfere when the power changes from AC to battery.)
- An alarm sound is generated at the power failure and the alarm cannot be turned off.

Section 3 Preparation

Installation Conditions 3.1
Connecting the Monitor to Other Instruments and Systems 3.2
    Connecting the Monitor to Other Instruments 3.2
        Standard Instruments 3.2
        Optional Instruments 3.2
    Using a UPS (Uninterruptable Power Supply) 3.2
    Connecting to a Network System 3.3
Operation Flowchart 3.4
Loading the Recording Paper 3.5
    Loading Paper in the WS-971R Recorder Unit 3.5
    Loading Paper in the Laser Printer 3.6
Turning Power On/Off 3.7
    Preparation Before Power On 3.7
    Turning the Display and Main Unit Power On 3.7
        Starting the Central Monitor System 3.8
    Turning the Power Off 3.8
    Turning the WS-971R Recorder Unit Power On 3.9
Preparation After Turning the Power On 3.10
    Changing Settings on the System Setup Screen 3.10
    Before Starting Monitoring 3.11
Check Before Use 3.12
    Check Before Turning On the Monitor 3.12
    Check After Turning On the Monitor and During Monitoring 3.12

Installation Conditions

Install the monitor where the screen can be seen clearly and does not reflect light.

WARNING

Install the central monitor and external instruments outside the patient environment (IEC 60601-1-1 2.204). If they are installed inside the patient environment, the patient or operator may receive electrical shock. For installation, contact your Nihon Kohden distributor or representative.

CAUTION

- **Do not install the monitor where it will be exposed to water or chemical solutions. Avoid direct sprinkling, spray or moist air from the nebulizer or humidifier. These cause malfunction and shorten the life of the monitor.**
- **Avoid exposing the monitor to direct sunlight. Otherwise, the temperature rises and it causes malfunction and shortens the life of the monitor.**
- **Avoid locations where the monitor may receive strong electromagnetic interference such as radio or TV stations, cellular phone or mobile two-way radios.**
- **Make sure that there is enough space between the monitor and the wall for adequate ventilation. Otherwise the internal temperature of the monitor rises, which leads to inaccurate operation and shortens the monitor life.**
  - **Leave more than 5 cm of space between the wall and vent holes on the sides and rear panels of the monitor.**
  - **When the monitor is surrounded, leave more than 10 cm of space above the monitor for ventilation. Do not let the surrounding temperature exceed 35°C during operation.**
- **Do not place blankets or cloth over the monitor. It may affect monitoring.**
- **Do not install the monitor in a dusty area.**
- **Connect the power cord to an AC outlet which can supply sufficient AC current to the monitor. The monitor cannot function properly with low current. Also the breaker trips and it causes electric power failure.**
- **When there is any problem with the monitor, turn off the power immediately and disconnect the power cord from the AC outlet. Take the monitor out of service and check for damage.**

Connecting the Monitor to Other Instruments and Systems

WARNING

- **Connect only the specified instruments to this monitor by following the specified procedure. Otherwise, electrical leakage current may harm the patient and operator.**
- **Before connecting or disconnecting instruments, make sure that the power of each instrument is turned off. Failure to follow this warning may cause electrical shock.**

NOTE

For the procedure, refer to the installation guide.

Connecting the Monitor to Other Instruments

Standard instruments

- Central monitor main unit MU-971RA/RJ/RK
- LCD unit VL-971R/RK or Nihon Kohden specified LCD display
- Keyboard, mouse

Optional instruments

- Recorder unit WS-971R
- Laser printer (Nihon Kohden specified printer)
- UPS (Nihon Kohden specified UPS)

Using a UPS (Uninterruptable Power Supply)

WARNING

Use a UPS which satisfies the safety standards specified by IEC and UL. Otherwise, lack of safety may cause electrical shock to the patient or operator.

CAUTION

- **Make sure that the UPS is properly grounded. Otherwise the operator may receive electrical shock.**
- **To assure an uninterrupted power supply, we recommend using the specified UPS. A sudden loss of power supply or an extreme power surge can damage the central monitor and delete stored data.**

Do not exceed the capacity of the UPS. Otherwise, the system program will crash at electric power failure and it damages the central monitor.
At electric power failure, immediately shut down the central monitor system with the normal procedure. After the backup period of the UPS, data may be lost or the instrument may get damaged.

Connecting to a Network System

For the procedure, refer to the CNS-9701 installation guide. The connection method and grounding method depends on the location where the central monitor is installed and the types and installation locations of other instruments.

Refer to the reference “General Requirements for Connecting Medical Electrical System” in Section 15. Follow IEC 60601-1-1.

WARNING

- **Connect the central monitor to the network as specified in the Network and System Installation Guide. Otherwise patient and operator may get electrical shock or other injury. For connecting the network, contact your Nihon Kohden distributor.**
- **Do not use a damaged network cable. Otherwise patient or operator may get an electrical shock when the damaged part is touched.**
- **Connect only the specified instruments to the connector or sockets marked with ⚠ by following the specified procedure. Otherwise, electrical leakage current may harm the patient and operator.**

CAUTION

Before connecting instruments, make sure that the power is turned off.

Operation Flowchart

CAUTION

Network settings and Windows 2000 system settings must only be set by qualified service personnel. Contact your Nihon Kohden distributor or representative.

NOTE

- **Contact your Nihon Kohden distributor or representative for system connection. System connection and system setup settings must be managed by a system administrator in your hospital.**
- **The system does not start without the blue protection key (standard accessory of the central monitor main unit) connected to the PROTECT KEY socket on the rear panel.**

For system connection and procedure before turning the power on, refer to the installation guide.

This section explains turning the central monitor power on/off, preparation at the central monitor after turning the power on and setting recording paper.

1. Connect the blue protection key (standard accessory of the central monitor main unit) to the PROTECT KEY socket via the connection cable (standard accessory of the central monitor main unit). Refer to the CNS-9701 installation guide for details.

2. Connecting the central monitor to other instruments
   Refer to the installation guide.
   Connect the central monitor main unit to the LCD display, recorder unit. Load the recording paper.

3. Connecting the central monitor to the network
   Refer to the installation guide.

4. Turning the central monitor power on
   Refer to the installation guide.
   Turn on the power of the central monitor and other instruments on the system.

5. Setting the system setup settings
   Set the necessary system setup settings. Refer to Section 4.

6. Admitting patients/Entering patient information/Starting monitoring

7. Setting for each bed (Parameter Setup, Personal Setup, Setup)

8. Starting monitoring.

Loading the Recording Paper

Loading Paper in the WS-971R Recorder Unit

CAUTION for Handling the Recording Paper

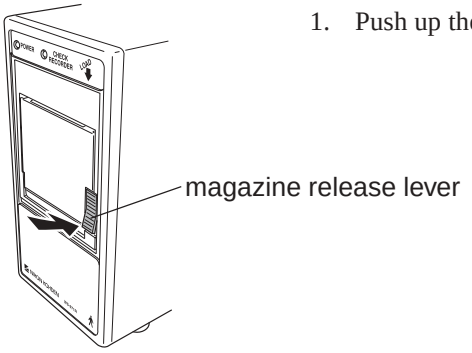
- **Do not allow paper to contact pastes, adhesive agents, oil-based felt pen tips or diazo process (ditto/spirit) copying paper. These discolor the paper surface.**
- **Do not allow paper to contact any materials containing vinyl chloride, plastic eraser, adhesive tape, fluorescent felt tip pen, or cinnabar seal ink because these discolor the recorded waveforms and data.**
- **Do not apply strong pressure to the paper. Rubbing or scratching discolors the paper surface.**
- **Do not allow paper to contact saline solution. The paper discolors and if the saline solution gets on the thermal head, there will be dots missing from the recorded data.**
- **Avoid high humidity, high temperature, direct sunlight and direct fluorescent light when storing recording paper. Otherwise the paper may discolor. Store the recording paper in a dry, cool place.**
- **When using glue on the recording paper, only use glue which consists of starch, polyvinyl alcohol, gum arabic, or carboxymethyl.**

CAUTION for Loading the Recording Paper

- **Correctly load the recording paper as specified. Otherwise, recording may not be performed properly.**
- **Do not touch the recording head with any hard material. When the head is tapped with hard material, the head may crack and the heater element wire may short-circuit.**
- **Clean the head surface with the provided head cleaner pen before loading new paper. After a period of usage, paper dust may accumulate between the paper and the head surface, and good printing cannot be obtained.**

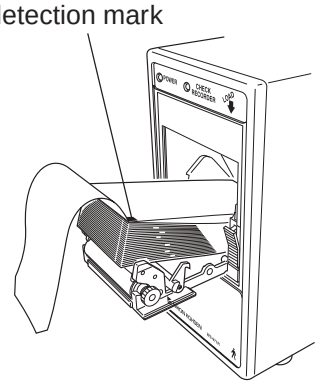
NOTE

Only use the specified recording paper, FQW50-3-100.



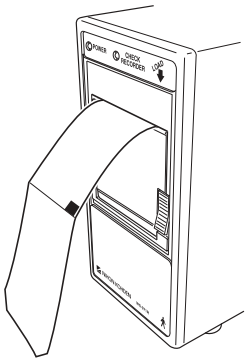
1. Push up the paper magazine release lever to open the paper magazine.

2. Open the paper magazine.



3. Set the recording paper (FQW50-3-100) inside the magazine so that the detection mark (small black square on corner) of the paper is on the right side.

4. Draw out one page of paper toward you and close the paper magazine.



5. Touch “REC” on the All Beds screen to confirm that recording starts. Then touch “REC” again to confirm that recording stops.

Loading Paper in the Laser Printer

Refer to the printer manual.

Turning Power On/Off

Preparation Before Power On

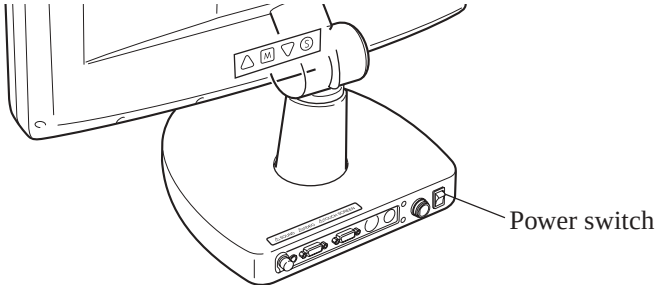
Confirm that the system connection is properly done. Refer to the installation guide. Load the recording paper in the recorder and printer. Prepare other instruments on the system.

Turning the Display and Main Unit Power On

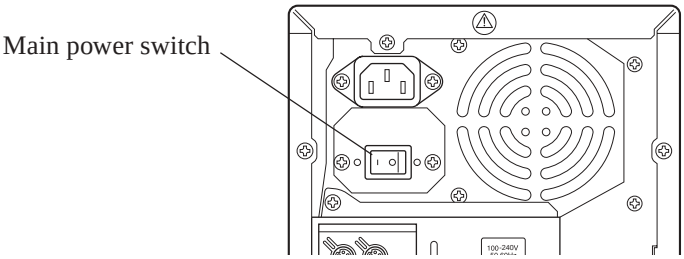
1. Press the power switch on the display unit to turn the power on (⊙).

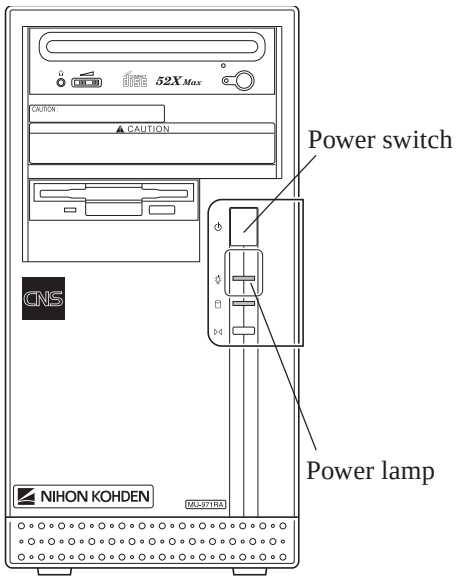
NOTE

- **When using the VL-971R/RK LCD unit, turn the LCD unit power on before turning the central monitor main unit power on. Otherwise the touch screen does not function.**
- **When using the recommended LCD display, refer to the display manual.**



2. Press the main power switch on the rear panel of the main unit to turn on the main power (|). The power lamp lights.





3. Slide the power switch cover on the front panel of the main unit and press the power switch to turn the power on. The power lamp lights. After the system check finishes, there is a test sound from the built-in speaker of the display.

CAUTION

After the power on, confirm that there is a test sound from the built-in speaker of the display.

The All Beds screen appears.

NOTE

- **If the power lamp does not light, confirm the power cord connection. The lamp does not light when the specified power is not supplied to the instrument.**
- **It takes a few minutes for the LCD screen to reach full brightness.**
- **The shadow of the previous screen may remain for a few minutes after changing screens.**
- **There may be some dots on the LCD screen which are always on or always off, but it does not affect monitoring. This is normal for all LCD screens.**

Starting the central monitor system

The system starts automatically when the central monitor main unit is turned on. To restart the system when Windows 2000 is running and the system has been shut down at least once before, double-click the “CNS9701.exe” icon on the desktop.

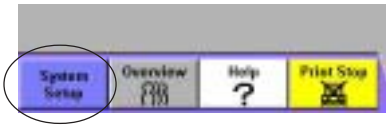
Turning the Power Off

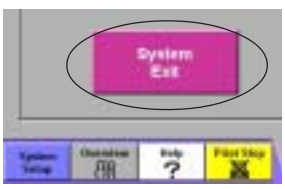
CAUTION

The central monitor power must be turned off in the specified order. Otherwise, patient data will be deleted and other data in the hard disk or the central monitor may be damaged.

NOTE

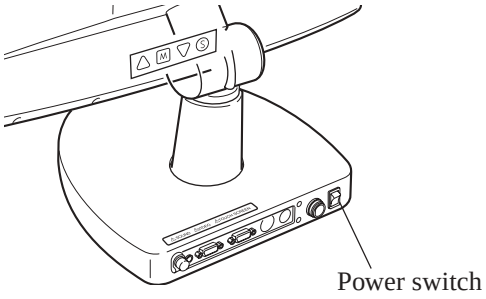
When the patient is transferred from one central monitor to the other, the data before the patient transfer is stored on the first central monitor. If this first central monitor power is turned off, the data before the patient transfer cannot be displayed on the second central monitor.





1. Shut down the central monitor system
   (1) Touch “System Setup”. The Revision window of the System Setup opens.
   (2) Touch “System Exit”. The confirmation window appears.
   (3) Touch “Yes” to shut down the system.
2. Shut down Windows 2000.
   Touch “Start” to select “Shut Down”. Select “Shut Down” and click “OK” when the confirmation window appears.

3. Turn the display power off.
   Press the power switch on the display to turn the display power off (⏻).



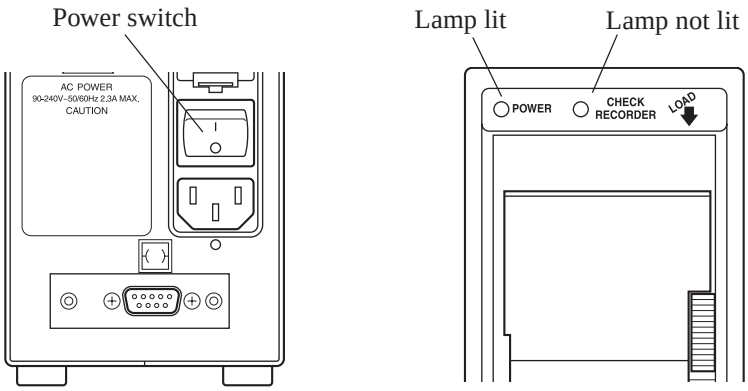
4. Turn the other instruments power off.

NOTE

Leave the power of the UPS and multiple patient receiver on.

Turning the WS-971R Recorder Unit Power On

Press the power switch on the rear panel to turn the recorder power on (|). Check that the POWER lamp lights and the CHECK RECORDER lamp is off.



Preparation After Turning the Power On

Changing Settings on the System Setup Screen

Set necessary settings on the System Setup screen. On the System Setup screen, you can set settings that affect the system.

Setting window	Setting items
Sound Control	Alarm sound volume, QRS sound settings (on/off, tone, QRS bed, volume)
Recording	Recording time (for manual recording, periodic recording, alarm/call recording, darkness)
Touchscreen Setting	Calibrate touchscreen
System Configuration	System Configuration settings (Units, Cover sheet for report recording, ECG 12 lead printing format, admission settings, Telemetry silence time, Vital sign alarm off mark, Screen timeout, Old NIBP display, NIBP effective time, All beds patient name display size), RS-232C setups
Monitor Setting	Display setting, Monitored beds setting, Bed name setting
ORG Setting	Settings for the ORG-9200/9700 multiple patient receiver
Mouse Setting	Settings for the mouse
Parameters	Select parameters which aren't currently measured to be displayed on setting keys
Name Registration	Editing and selecting CNS group name, editing and saving the message displayed during temporary discharge
Parameter Colors	Display color for each parameter
Alarm Master	Editing alarm masters
Function Keys	Assigning functions to function keys
Date & Time	Setting date and time displayed on the screen **NOTE** **Changing this setting affects the entire network.**
Maintenance	Confirming network, changing the password to access some windows of the System Setup.

NOTE

The shaded settings need a password to access. These settings can only be entered or changed by operators who have the authority and password.

Before Starting Monitoring

Before starting monitoring of a patient, do the following preparation.

WARNING

Before you start monitoring a new patient, confirm alarm settings. When monitoring via ORG-9200/9700 multiple patient receiver, the alarm settings return to the Alarm Master 1 settings when a bed is discharged or data is deleted.

1. Admit a patient
   When you monitor a patient via a telemetry system, set the receiving channel.

2. Confirm alarm settings.

3. Set the setting for the bed (as needed)
   - recording settings
   - channel settings
   - other settings

4. Checking the receiving condition of the telemetry system.
   Press the Call button on the transmitter to confirm that the signal from the transmitter is correctly received at the central monitor.

5. Prepare the patient for measurement (electrode attachment and connection)
   Refer to the operator’s manual of bedside monitors.

Check Before Use

Check the following items before turning on the monitor. If any problem is detected, take the proper countermeasure according to the troubleshooting and maintenance sections. If there is any damage or the instrument is suspected to be faulty as a result of checking, attach an “Unusable” or “Repair request” label to the instrument and contact your Nihon Kohden distributor or representative.

Check Before Turning On the Monitor

- Enough electrodes and electrode leads are ready.
- Enough recording paper is in the recorder.
- Cleaned and sterilized sensors and transducers are ready.
- The blue protection key (standard accessory of the central monitor main unit) and protection keys for the optional QP-971P/972P/973P/974P program kits are securely connected.
- Power cord is connected properly.
- Equipotential grounding lead is connected properly when equipotential grounding is required.
- The system is connected properly.
- All cables for measurement are connected properly.
- The channel setting at the central monitor matches the transmitter channel.
- The transmitter battery is not weak.
- No scratches, damage or dirt on the monitor, sensors and electrodes.
- No damage to the keys, switch, lamps and panels.
- No damage to the power cord.
- No damage or dirt to the electrode leads, transducers, probes and cables.
- The monitor is not in a wet place.
- The transmitter has the battery cover.

Do not use anything sharp to touch the LCD screen (touchscreen), power switches and other keys. Otherwise it may damage the instrument.

Check After Turning On the Monitor and During Monitoring

To start monitoring safely and properly, check the following items after turning on the monitor. If any problem is detected, take the proper countermeasure according to the troubleshooting and maintenance sections.

- The power lamp lights.
- There is no fire, smoke or smell.
- A bong sounds when the central monitor system program starts.
- The monitor is not too hot. The monitor does not give an electric shock when touched.
- No error message is displayed on the screen.
- The time on the screen is correct.
- The low battery mark for the transmitter does not appear on the transmitter LCD display.
- The monitor does not affect surrounding equipment.

- The data and waveforms are displayed properly.
- The touch keys function properly. (when using the display with touchscreen function)
- Keys and switch operate properly.
- The keyboard and mouse operate properly.
- Alarm functions properly.
- When the CALL button on the transmitter is pressed within the specified range of the central monitor, a message appears on the central monitor screen.
- There is no trouble in recording.
- No error display and malfunction during operation.
- Other instruments on the system operate normally.

CAUTION

After turning the power on, confirm that a bong sounds from the built-in speaker of the display.

NOTE

After turning the monitor on and when admitting a patient on the monitor, make sure that the time displayed at the upper right of the screen is correct. The clock may gain or lose time during operation. When the date or time is changed during monitoring, the date and time of all stored data is also changed and may not match the date and time on the printout.

Section 4 System Setup Screen

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Overview of the System Setup Screen

On the System Setup screen, you can set settings that affect the system.

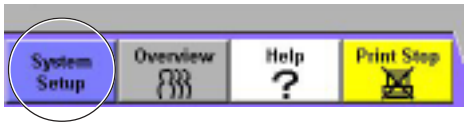
Setting window	Setting items
Sound Control	Alarm sound volume, QRS sound settings (on/off, tone, QRS bed, volume)
Recording	Recording time (for manual recording, periodic recording, alarm/call recording, darkness)
Touchscreen Setting	Calibrate touchscreen
System Configuration	System Configuration settings (Units, Cover sheet for report recording, ECG 12 lead printing format, admission settings, Telemetry silence time, Vital sign alarm off mark, Screen timeout, Old NIBP display, NIBP effective time, All beds patient name display size), RS-232C setups
Monitor Setting	Display setting, Monitored beds setting, Bed name setting
ORG Setting	Settings for the ORG-9200/9700 multiple patient receiver
Mouse Setting	Settings for the mouse
Parameters	Select parameters which aren't currently measured to be displayed on setting keys
Name Registration	Editing and selecting CNS group name, editing and saving the message displayed during temporary discharge
Parameter Colors	Display color for each parameter
Alarm Master	Editing alarm masters
Function Keys	Assigning functions to function keys
Date & Time	Setting date and time displayed on the screen **NOTE** **Changing this setting affects the entire network.**
Maintenance	Confirming network, changing the password to access some windows of the System Setup.

NOTE

The shaded settings need a password to access. These settings can only be entered or changed by operators who have the authority and password.

Displaying the System Setup Screen

Touch “System Setup” to display the System Setup screen.



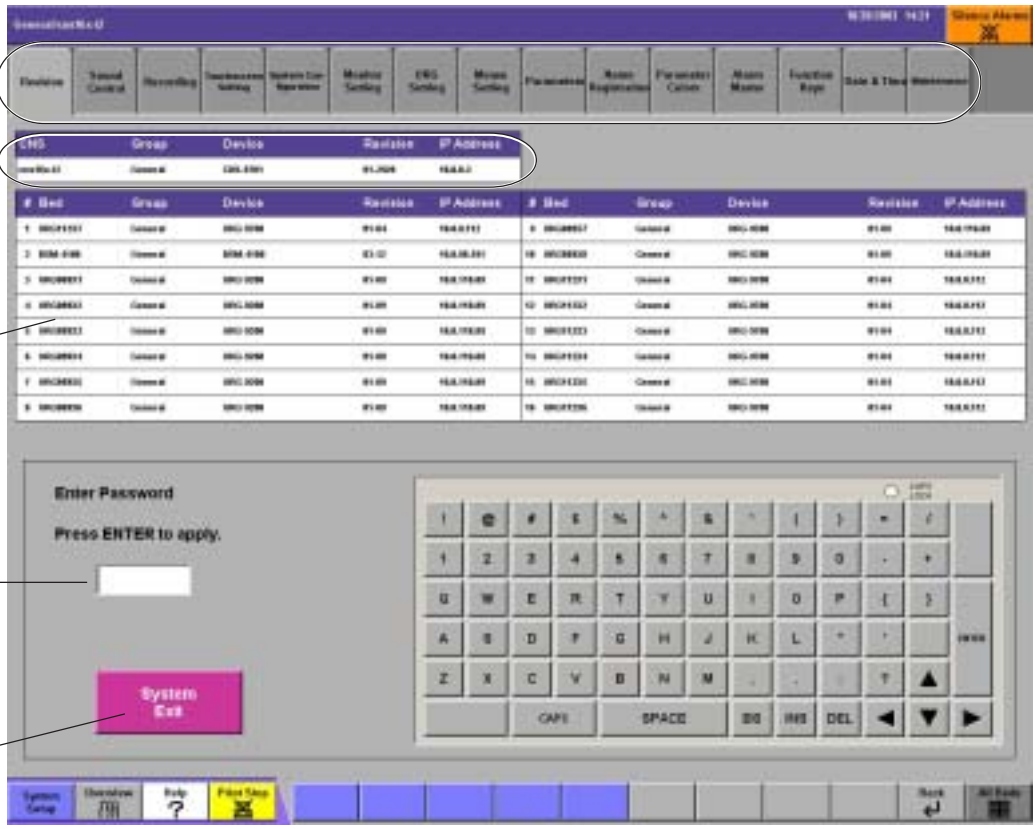
Touch to open another window

Central monitor information

Monitored bed information

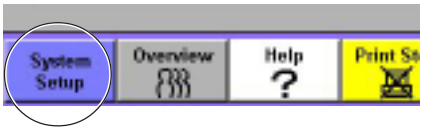
Enter the password

Touch to shut down the system



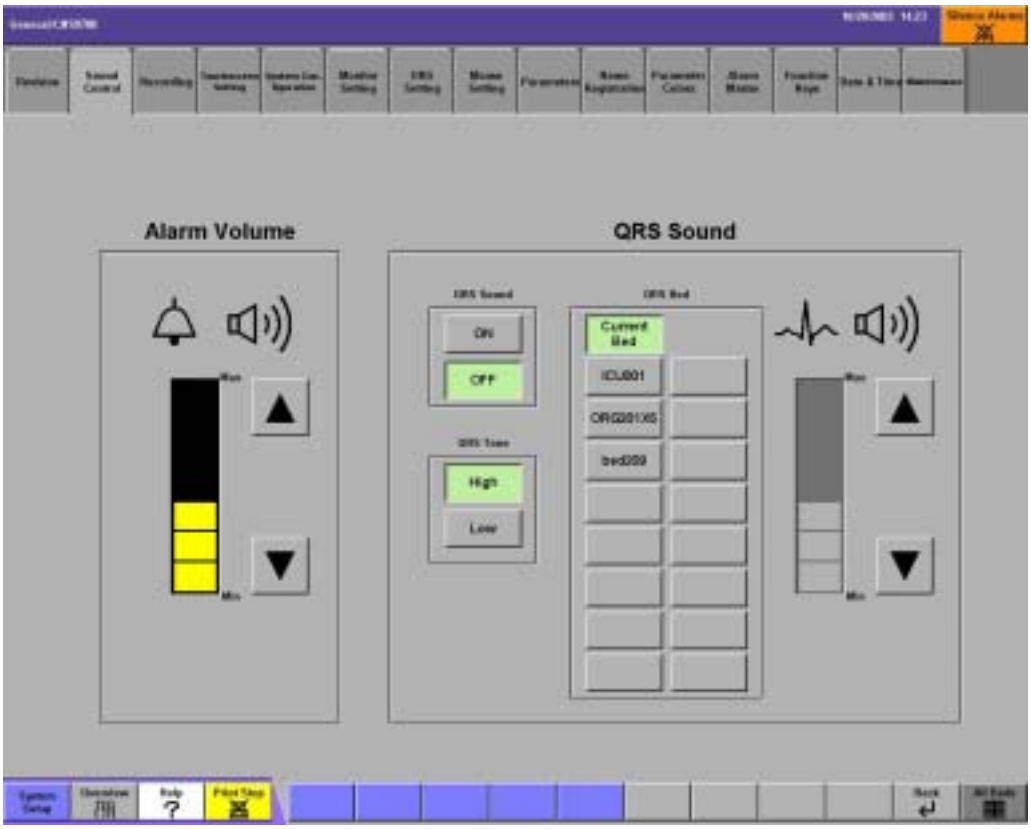
Sound Control

Set alarm sound volume, QRS sound on/off, QRS tone, QRS bed and QRS sound volume.



1. Touch “System Setup” to display the System Setup screen.

2. Touch “Sound Control” to display the Sound Control window.



Setting Alarm Sound Volume

The volume can be set in seven steps.

NOTE

There is an alarm sound even when set to the minimum step level.

WARNING

Do not adjust the sound volume at the display unit. If you decrease the display unit volume to the minimum, there is no alarm sound.

Touch “▲” or “▼” to increase or decrease the volume. To check, there is a sound of the selected level every time you touch “▲” or “▼”. You can also change the volume by directly touching the bar.

Setting QRS Sound

CAUTION

- **The central monitor does not perform ECG analysis. Therefore, the QRS sound at the central monitor may not synchronize with patient's actual QRS when complicated arrhythmias occur or during pacing.**
- **The QRS sound at the central monitor has a delay of approximately several seconds because of network connection.**

Turning the QRS Sound ON/OFF

Set the QRS sound on or off. Touch "ON" or "OFF" in "QRS Sound".

Changing the QRS Tone

Set the QRS tone. Touch "High" or "Low" in "QRS Tone".

Setting the QRS Bed

Select the bed of the QRS sound source. For the bed selected as the QRS Bed, the QRS sync mark (♥) appears on the All Beds screen, Individual Bed screen and basic information area.

Touch a desired key in "QRS Bed".
Current Bed: QRS sound source is a currently selected bed.
(Specific Bed Name): QRS sound source is always the specific bed.

Setting QRS Sound Volume

The setting procedure is the same as setting alarm sound volume.

Recording

Refer to Section 10.

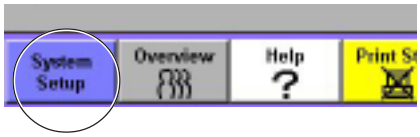
Touchscreen

Refer to Section 14.

System Configuration Settings

On the System Configuration window, you can set system settings of the central monitor.

Changing Values on the System Configuration window

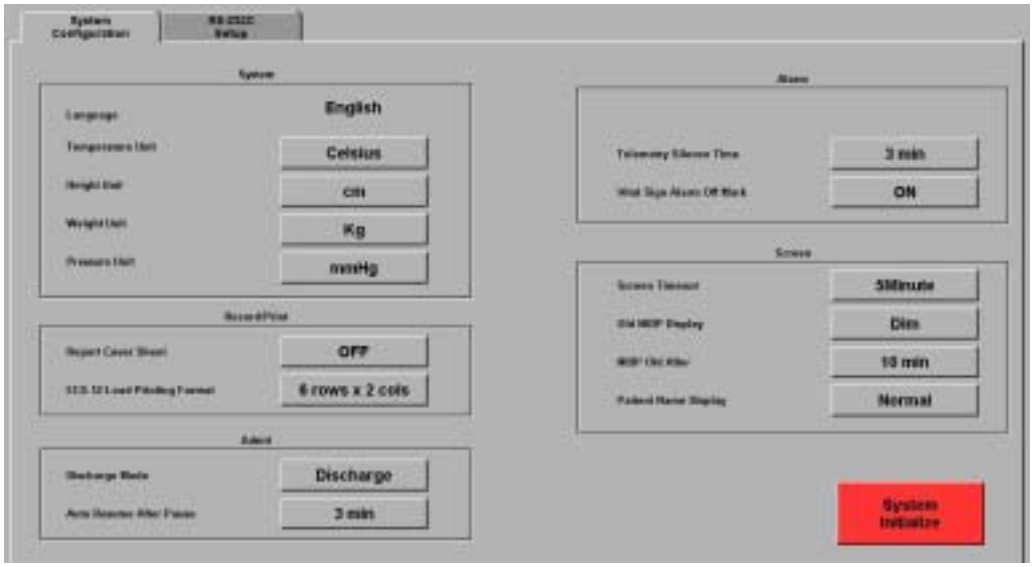


1. Touch “System Setup” to display the System Setup screen.

2. Enter the password.

The password is displayed as ****.

3. Touch “System Configuration” to display the System Configuration window.



4. Touch the key for the item you want to change. The setting window opens.

5. Touch the key for the desired value.

6. Touch “⊠” to set the entry.

Changing Unit Settings

NOTE

Changing units affects the entire network. A changed value takes effect at the moment "Yes" is touched on the confirmation window.

Temperature Unit

Celsius/Fahrenheit

Height Unit

cm/inch

Weight Unit

kg/lb

Pressure Unit

mmHg/kPa

Changing Recording/ Printing Settings

Report Cover Sheet

Select whether or not to print the cover sheet in report printing. Select ON or OFF at "Report Cover Sheet".

The following information is printed on the cover sheet.

- Patient information
- Date and time of report creation
- Report creation conditions
- Comment (Nurse Notes)
- ECG waveform (5-second waveforms 5 minutes before the end time of printing data)

ECG 12 Lead Printing Format

Select printing format (number of leads × number of traces) of the all ECG waveforms (maximum 12 leads) display on the ECG 12 Lead Display window of the Individual Bed screen and the Overview Bed screen.

Selectable formats: 6rows × 2cols, 12rows × 1cols, 3rows × 4cols

Changing Admitting/ Discharging Settings

Discharge Mode

There are two modes for discharging mode.

- Discharge mode: When “Discharge” is touched, all patient data is deleted, the bed becomes “Off”, and monitoring ends. To restart monitoring, do the admitting operation.
- Delete Data mode: When “Delete Data” is touched, all patient data is deleted, the bed does not become “Off”, and monitoring continues.

Auto Resume After Pause

When the pause period is set, you restart monitoring patient at the bedside monitor (transmitter) and monitoring continues for as long as the pause period, the temporary discharge automatically releases and monitoring resumes at the central monitor. The factory default pause period is 3 min.

When OFF is selected, monitoring at the central monitor does not resume until “Resume” is touched on the Admit/Discharge window.

Selectable values: OFF, 10 sec, 30 sec, 1 min, 2 min, 3 min

Alarm Settings

Telemetry Silence Time

This setting is for beds connected via the ORG-9200/9700 multiple patient receiver. Set the alarm silence time when the Silence Alarms key (🔕) is touched.
Selectable values: 1 min, 2 min, 3 min, 4 min, 5 min, 10 min

Turning Vital Sign Alarm Off Mark Display ON/OFF

Set whether or not the vital sign alarm off mark is displayed.

ON: Displays the vital sign alarm off mark depending on the setup of the bedside monitor.
OFF: Does not display the vital sign alarm off mark.

Screen Settings

Setting Screen Timeout

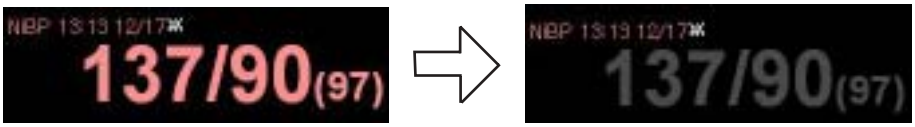
When any screen other than the All Beds screen is displayed and there is no operation for a preset period, the screen automatically returns to the All Beds screen. Enter the period with the numerical pad keys on the screen and touch “ENTER” to fix the entry.

Selectable values: OFF, 1 to 30 min

Old NIBP Display Setting

Select whether to dim or hide the old data.

- Dim: NIBP measurement is dimmed.
- Hide: NIBP measurement deleted and “---” displayed.



NIBP Effective Time Setting

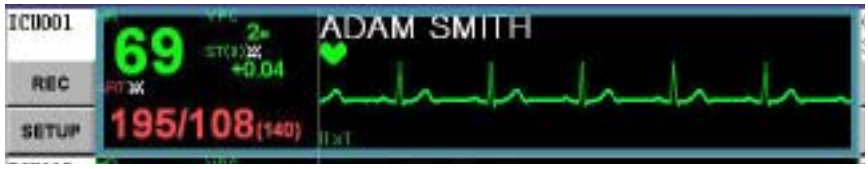
Select how long to wait after NIBP measurement to dim or hide NIBP.

Selectable values: 10 min, 30 min, 1h, 24h

All Beds Patient Name Display Size

You can select the size of the patient's name display on the All Beds screen.

- normal



- large

RS-232C Settings

1. Touch "RS-232C Setup" to display the setting window.

2. Set the necessary settings.
   The factory default settings are underlined.

- Baud Rate: 2400, 4800, <u>9600</u>, 14400, 19200, 38400
- Data Bits: 7, <u>8</u>
- Parity: <u>None</u>, Even, Odd
- Stop Bits: <u>1</u>, 1.5, 2
- Flow Control: <u>None</u>, XON/XOFF, Hardware, Hardware XON/XOFF
- Communication Mode: <u>NK Protocol</u>, Off

Monitor Settings

NOTE

The Monitor settings can only be set by an operator who has the authority and password.

There are three categories of monitor setting.

- Monitored Beds Setting
- Bed Name Setting
- Display Setting

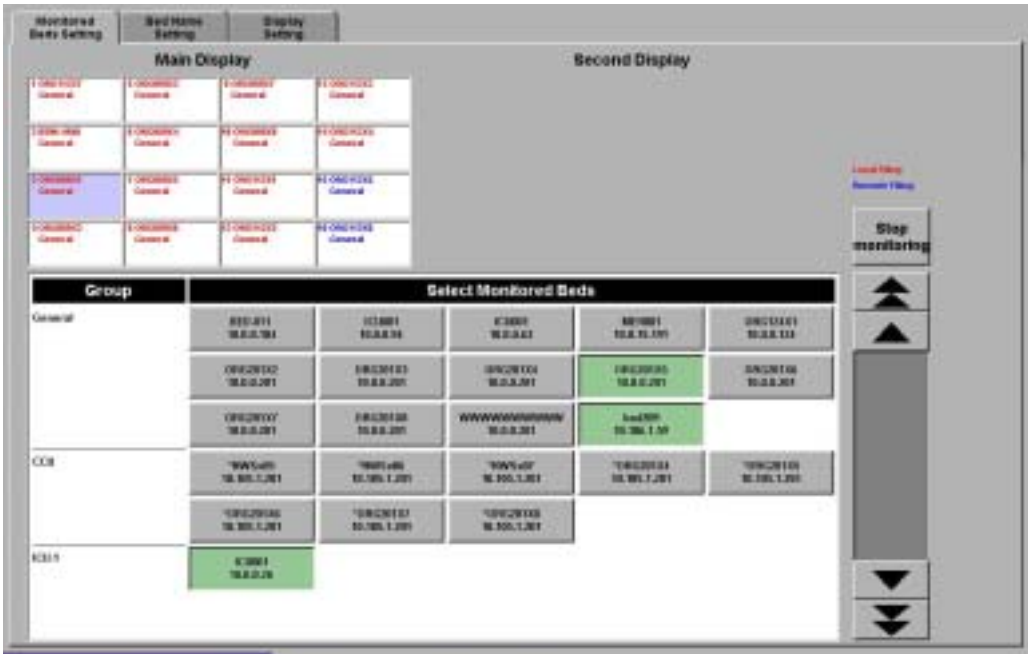
Displaying the Monitor Setting Window

1. Touch “System Setup” to display the System Setup screen.

2. Enter the password.

The password is displayed as ****.

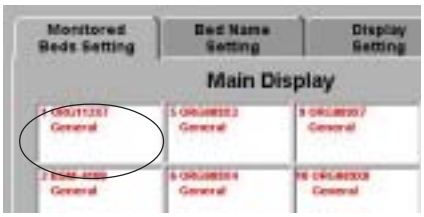
3. Touch “Monitor Setting”. The Monitor Setting window opens.



Registering Monitored Beds

You can register monitored beds from up to 300 beds on the network. Monitored beds are the beds that are continuously monitored at the central monitor. When you register a monitored bed, you need to select whether or not to save the bed's data at the central monitor.

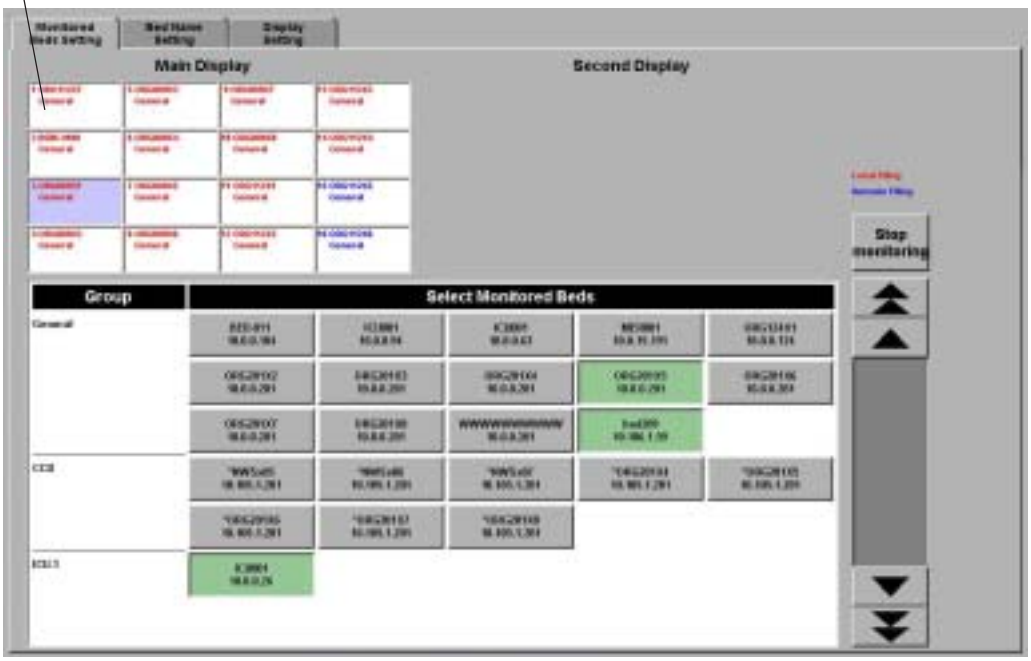
1. Touch "Monitored Beds Setting". The setting window opens.



2. Touch the frame of the display position you want to change the bed for. The layout of display positions on this screen corresponds to the layout on the All Beds screen.

3. Touch the bed to be monitored in "Select Monitored Beds".

Red: Beds whose data is saved in this central monitor
Blue: Beds whose data is saved in another central monitor



A window to confirm data storage for the bed opens. When the bed's data is saved at another central monitor, this window does not open.

NOTE

- **If you try to register a bed to a position where another bed is already registered, a dialog box asks if you want to delete other bed's registration (stop monitoring the bed). Touch "Yes" to delete the other bed's registration and all saved data for the bed. Touch "No" to keep the other bed's registration and cancel registration of a new bed.**
- **If you register a previously registered bed to the position of another bed, the positions of the two beds are switched.**

4. Touch “Yes” or “No” to select whether or not to save the bed’s data at this central monitor.

Data Storage

Availability of settings and operations depends on whether or not the bed’s data is saved in this central monitor or another central monitor.

Beds whose data is saved in this central monitor (Red):
This central monitor is the main central monitor for the bed. Review data such as full disclosure waveform and recall files are saved in this central monitor. All settings and operations are available at this central monitor.

Beds whose data is saved in another central monitor (Blue):
This central monitor is not the main central monitor for the bed. For review data such as full disclosure waveform and recall files, this central monitor refers to another central monitor that saves the bed’s data. This central monitor cannot set the settings for data storage such as admitting/discharging, patient transfer, stored waveform setting, etc.

NOTE

- **Data for a bed can only be saved in one central monitor.**
- **If a bed’s data is not saved in any central monitor, the bed’s review data cannot be displayed on any central monitor. Be sure to save a bed’s data in one of the central monitors on the network.**

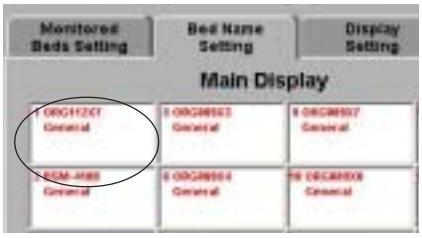
Setting Bed Name Setting

NOTE

Do not use the same bed name for more than one bed in a group.

1. Touch “Bed Name Setting” to display the setting window.

2. Touch the key of the desired bed.



3. Enter the bed name from the keyboard on the screen. You can enter any name of up to 8 or 10 alphanumeric characters.

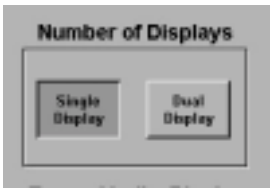
4. Touch “ENTER” to register the setting.

Setting Display Setting

Touch “Display Setting” to display the setting window.

Changing the Number of Displays

Select the number of displays to be connected to the central monitor.
Select either Single Display or Dual Display at “Number of Displays”.



To select “Dual Display”, you need to enable VIDEO 2 output on Windows 2000 in advance. Only VIDEO 1 is enabled at the factory default setting.

Expand Individual Bed Screen

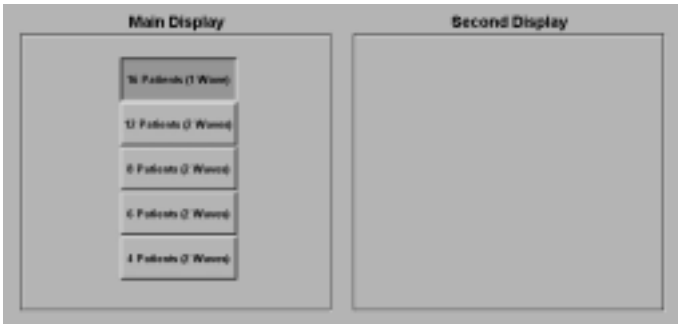
You can monitor with dual displays and set both displays to All Beds screen or one display to Expand Individual Bed screen.
To set this, select one of the followings on the Expand Indiv. Display of the Monitor Settings.

- OFF : Both displays show the All Beds screen and the Individual Bed screen.
- Main Display: The Main Display shows the Expand Individual Bed screen and the Second Display shows the All Beds screen.
- Second Display: The Second Display shows the Expand Individual Bed screen and the Main Display shows the All Beds screen.

When you change the setup of the Individual Bed screen, a window to confirm the shutdown of the system appears. Touch “OK” to go back to the windows screen. Double click “CNS9701.exe” to start the central monitor program. The Expand Individual Bed screen is displayed.

Changing the Number of Patients Displayed on the Main Display and Second Display

Set the number of patients to be displayed on the All Beds screen.
When you use dual displays, set for each display.
Selectable values: 16 Patients (1 Wave), 12 Patients (2 Wave), 8 Patients (2 Wave), 6 Patients (2 Wave), 4 Patients (2 Wave)



NOTE

You cannot select fewer patients than are registered to monitored beds.

Setting the All Beds Numeric Area

Set the size of the numeric area on the All Beds screen.

The size of the numeric values changes to fit with the numeric area.

- normal:

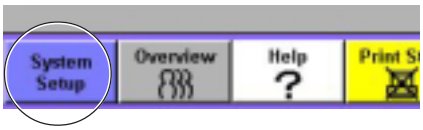
- large:

ORG Settings

NOTE

The ORG settings can only be set by an operator who has the authority and password.

Set the settings for the ORG-9200/9700 multiple patient receiver. This setting can only be set at the central monitor that is monitoring beds via the ORG-9200/9700 multiple patient receiver.



1. Touch “System Setup” to display the System Setup screen.

2. Enter the password.

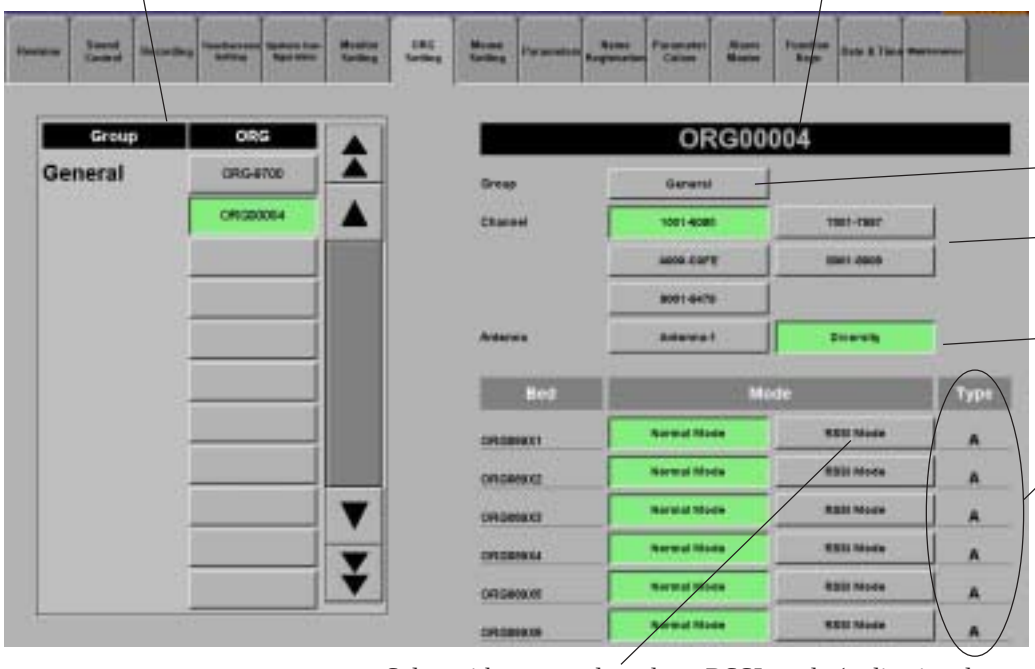
The password is displayed as ****.

3. Touch “ORG Setting”. The ORG Setting window opens.

4. Touch the key for the desired ORG. Set the necessary settings.

Touch the key of the ORG for which you want to change settings. The ORG name is its serial number.

ORG you are currently changing the settings for.



Set the name of the group the ORG belongs to.

Set the channel band the ORG belongs to.

Select the antenna type.

Select the transmitter type, A or C, for each bed.

Select either normal mode or RSSI mode (radio signal strength indicator) for each bed. In RSSI mode, the radio field strength of each bed is shown as a number from 0 to 15 (the larger the number, the stronger the radio field strength).

Mouse Settings

Up to six displays can be operated by one mouse. This includes other central monitors and dual displays. The mouse settings are set at the central monitor where the mouse is connected.

NOTE

When you want to operate CNS-9701 and CNS-9300 series central monitors with one mouse, connect the mouse to the CNS-9701 central monitor.

Displaying the Mouse Setting Window

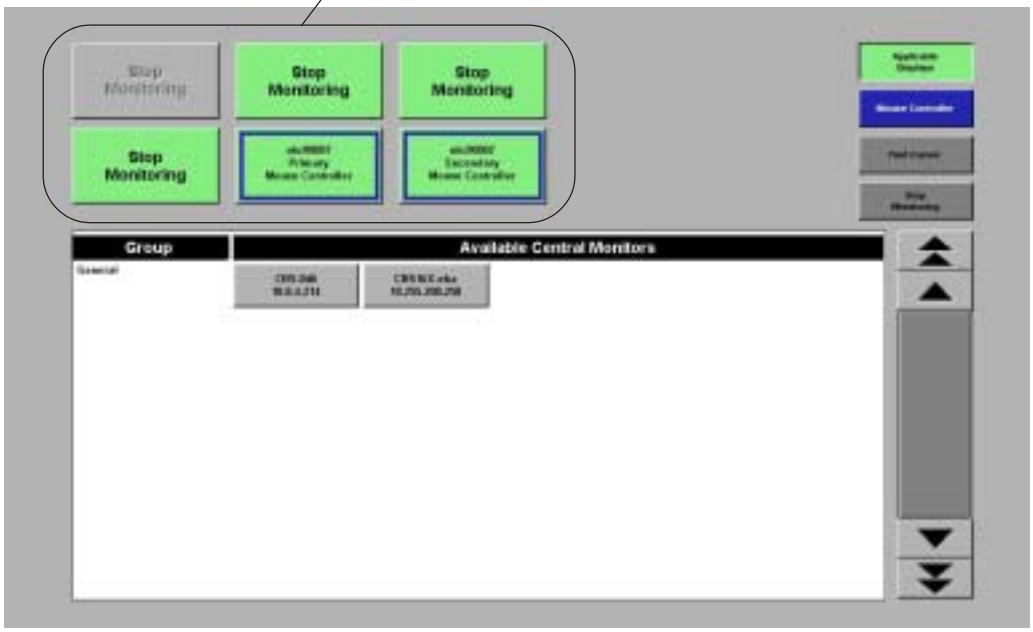
1. Touch “System Setup” to display the System Setup screen.

2. Enter the password.

The password is displayed as ****.

3. Touch “Mouse Setting”. The Mouse Setting window opens.

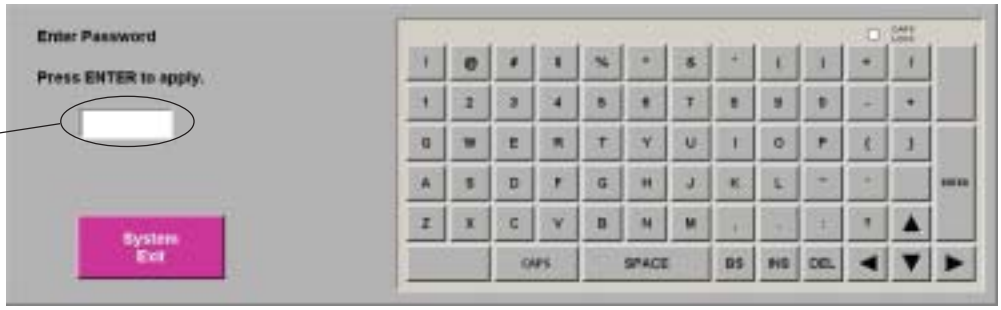
In general, these six display positions correspond to the physical locations of the actual display units. “Primary Mouse Controller” indicates the display position of the first display unit of this physical monitor. If this monitor has a dual display, “Secondary Mouse Controller” indicates its display position.



Moving the Mouse to Another Display Unit

1. Touch “System Setup” to display the System Setup screen.

2. Enter the password.

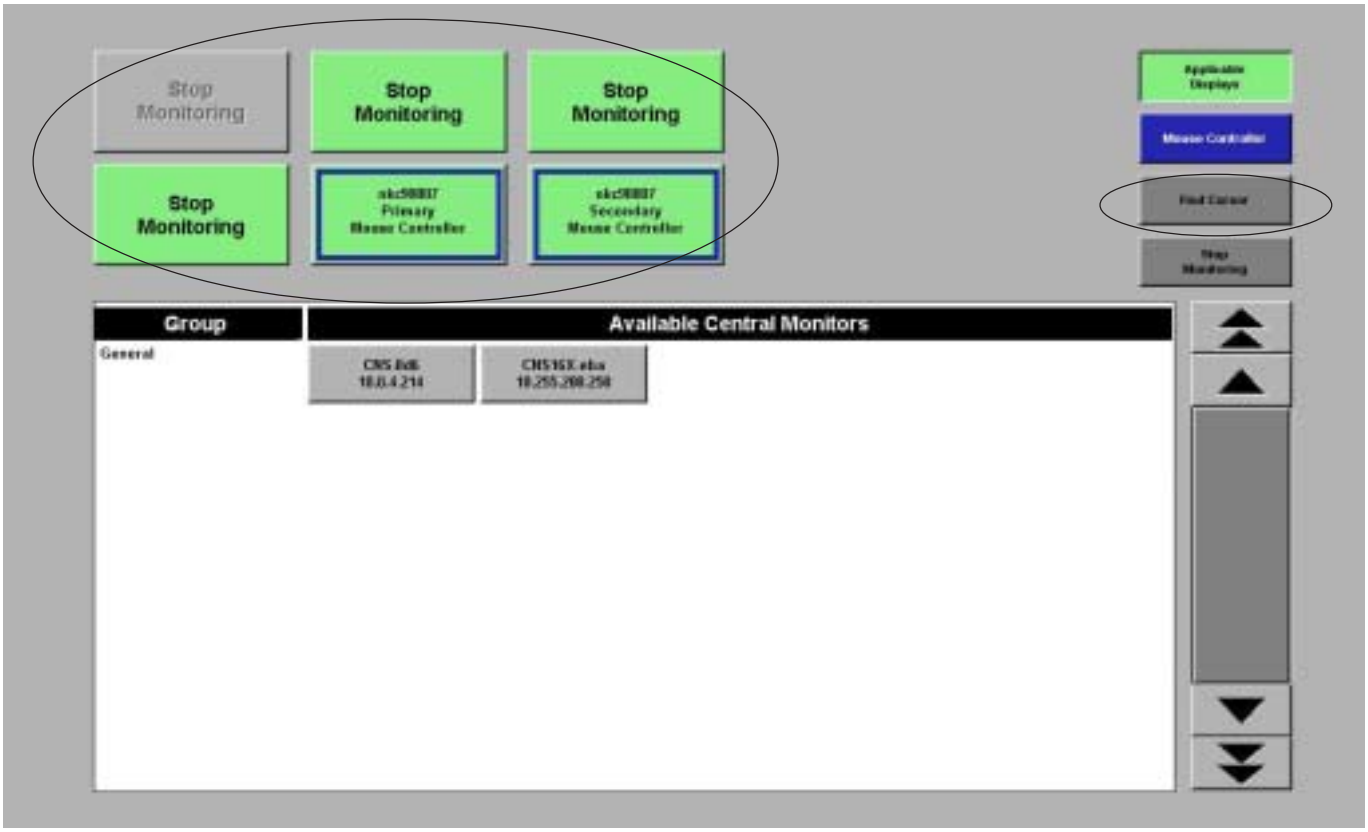


The password is displayed as ****.

3. Touch “Mouse Setting”. The Mouse Setting window opens.
   If a display position is dim, the mouse cannot move there.

4. If the mouse is not on this physical display unit, touch “Find Cursor”. The mouse cursor moves to this central monitor display unit.

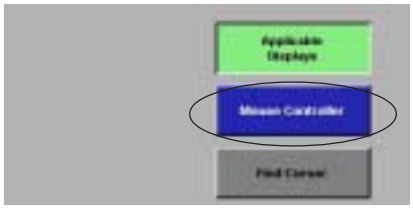
5. In the six display positions, move the mouse up, down, left or right toward the display position of the display unit you want to operate the mouse on.



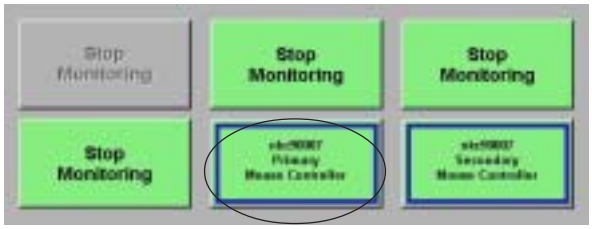
Selecting the Mouse Position

Select the central monitor where the mouse is connected.

1. Touch “Mouse Controller”.



2. Touch the position of the central monitor that the mouse is connected to.



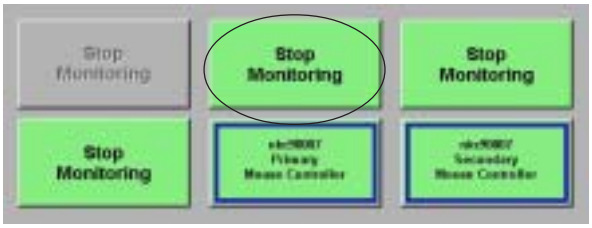
In dual display mode, the second display (Secondary Mouse Controller) is automatically set to the right of the first display (Primary Mouse Controller).

Selecting the Central Monitor Where Mouse Can Operate

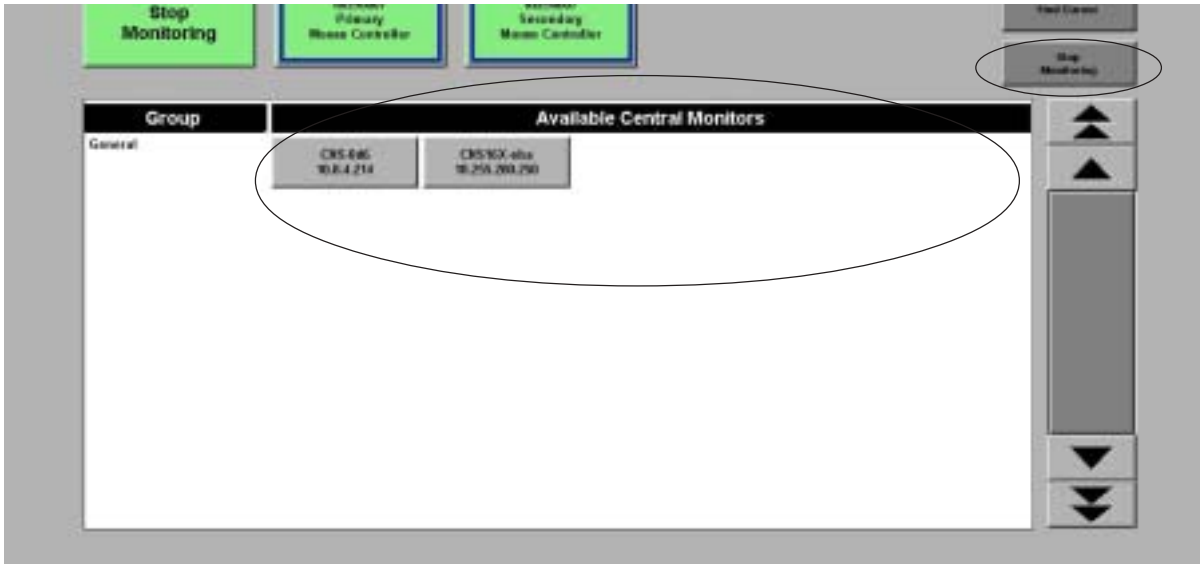
Set the central monitors where the mouse can operate. Up to six central monitors can be selected.

1. Touch “Applicable Displays”. The selectable central monitors are displayed in “Available Central Monitors”.

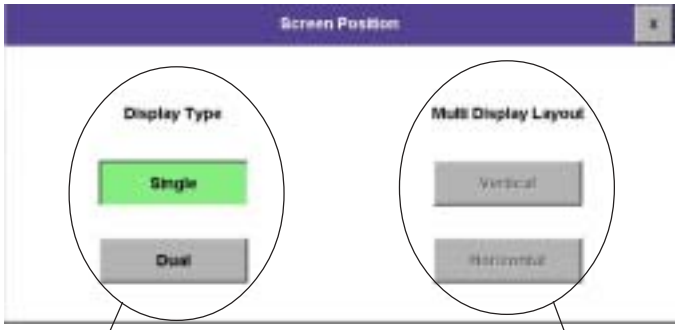
2. To select the desired central monitors,
   (1) Touch the key of the position to change the mouse control settings for.



(2) In “Available Central Monitors”, touch the desired central monitor. Or, touch “Stop Monitoring” to select no central monitor for the selected position.



(3) A setting window for the selected central monitor opens. (The setting window does not open when the selected central monitor is the CNS-9300 series central monitor.) Set the settings for the central monitor.



Display type:
Select either single display or dual display

Dual display layout type:
When using in dual display mode, select whether the central monitor is placed vertically or horizontally.

(4) Touch “⊠” to close the window and register the setting.

Parameters

You can select parameters which aren't currently measured to be displayed on the keys on the screen. The selected parameters appear on setting keys even when the parameter is not measured.

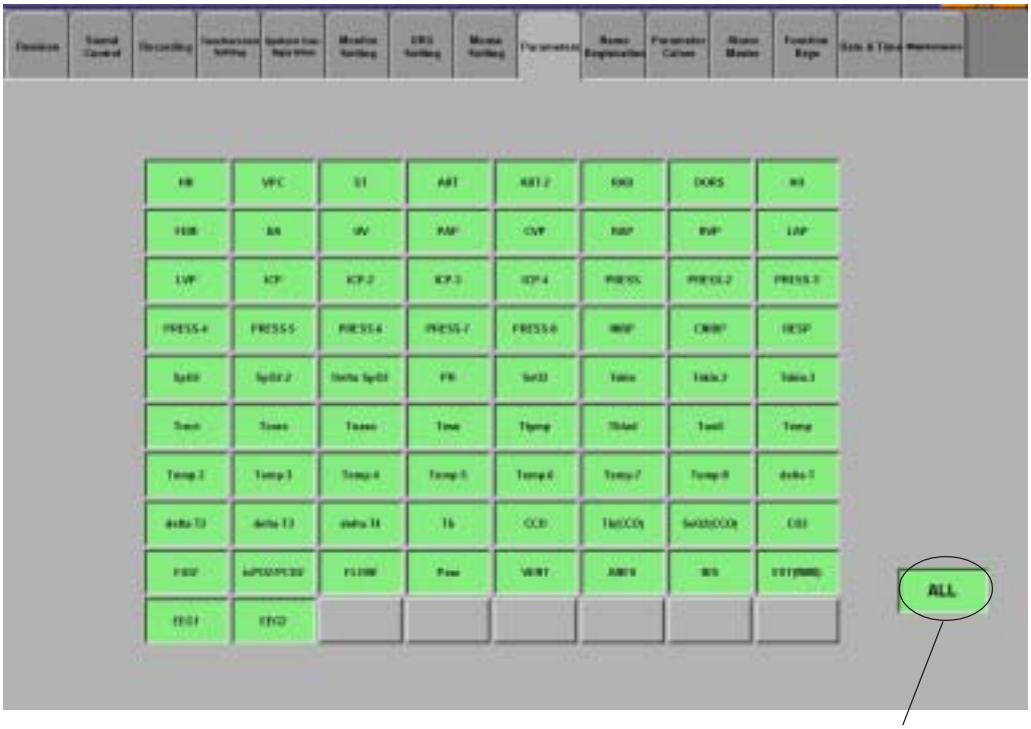
1. Touch "System Setup" to display the System Setup screen.

2. Enter the password.

The password is displayed as ****.

3. Touch "Parameters". The Parameters window opens.

Every touch of a key toggles between selected and unselected.



Every touch of this key toggles between "select all" and "select nothing"

Group Name and Temporary Discharge Message Settings

The name of a central monitor is set on Windows 2000. Refer to the CNS-9701 installation guide.

On the Name Registration window, set the following settings.

- Set Group Name
- Edit Group Names
- Edit Pause Location Names

Displaying the Name Registration Window

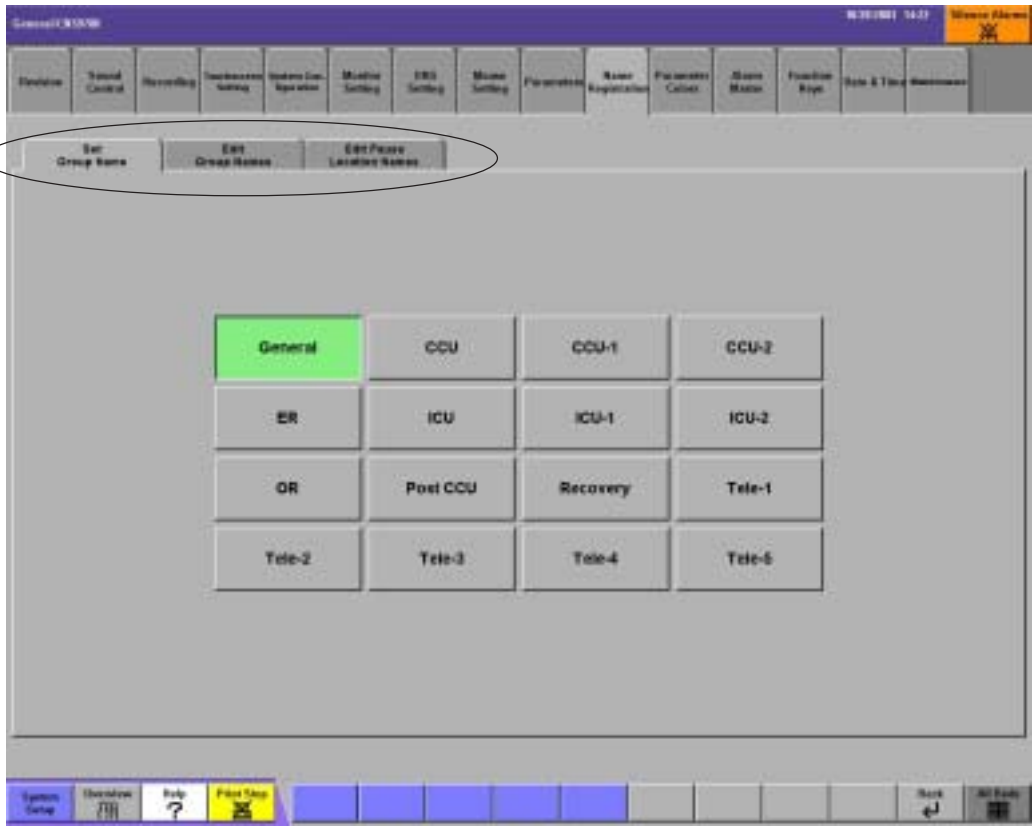
1. Touch “System Setup” to display the System Setup screen.

2. Enter the password.

The password is displayed as ****.

3. Touch “Name Registration”. The Name Registration window opens.

Touch to open another setting window.

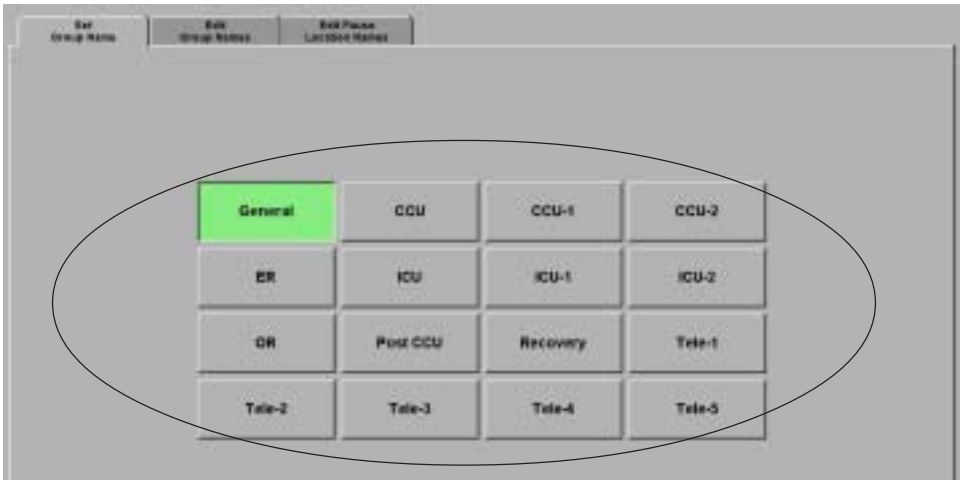


Setting the Group

Set the location (group) on the network where the central monitor is installed. The factory default setting is “General”.

1. On the Name Registration window, touch “Set Group Name”. The setting window opens.

2. Touch the key for the desired group.



Editing Group Names

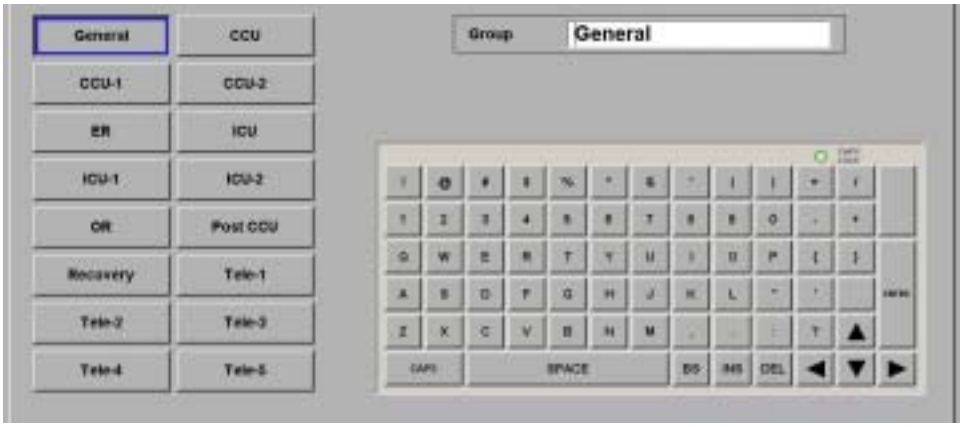
NOTE

This settings can only be set by an operator who has the authority and password.

Edit group names of up to 8 alphanumeric characters. Group names are shared in the entire network. Up to 16 names can be saved.

1. On the Name Registration window, touch “Edit Group Names”. The setting window opens.

2. Touch the key for the group you want to change the name for and then enter the desired name from the keyboard on the screen.



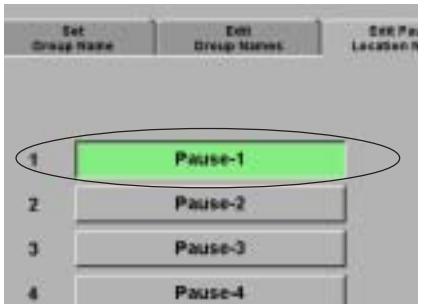
3. Touch “ENTER” to save the setting.

Editing the Message on Temporarily Discharged Beds

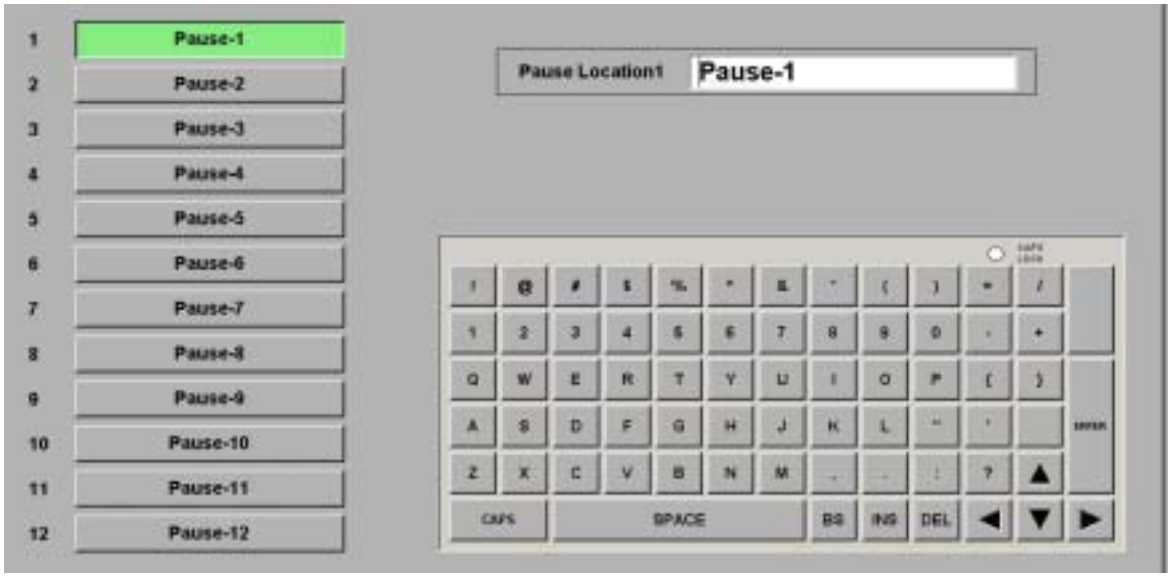
You can edit the message displayed on temporarily discharged beds. Up to 12 messages can be saved.

1. On the Name Registration window, touch “Edit Pause Location Names”. The setting window opens.

2. Touch the key you want to edit the message for.



3. Enter the message from the keyboard on the screen.



4. Touch “ENTER” to save the setting.

Setting the Parameter Colors

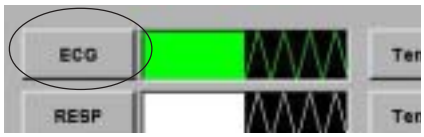
You can set the color for each parameter.

1. Touch “System Setup” to display the System Setup screen.

2. Enter the password.

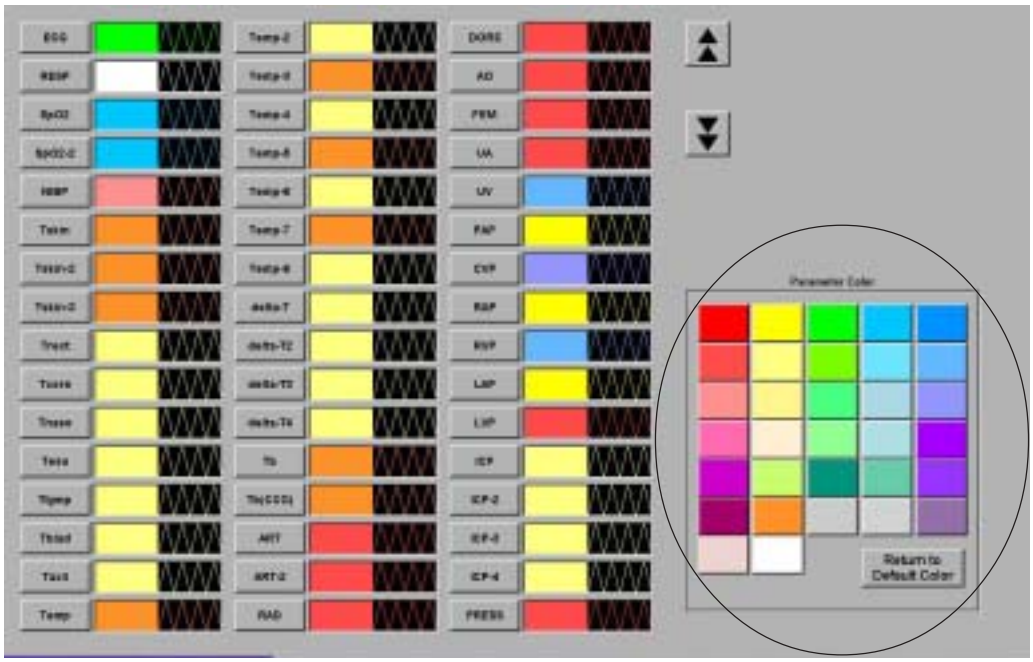
The password is displayed as ****.

3. Touch “Parameter Colors”. The Parameter Colors window opens.



4. Touch the key of the parameter you want to change the color for. You can confirm the color displayed on the window next to the key.

5. Touch the key of the desired color in “Parameter Colors”.
Press “Return to Default Color” to return the color of the currently selected parameter to the factory default setting.



Setting the Alarm Master

Refer to Section 6.

Setting Function Keys

There are five free function keys on the bottom of the screen. For quick operation, it is convenient to assign frequently used functions and windows to the function keys.

1. Touch “System Setup” to display the System Setup screen.

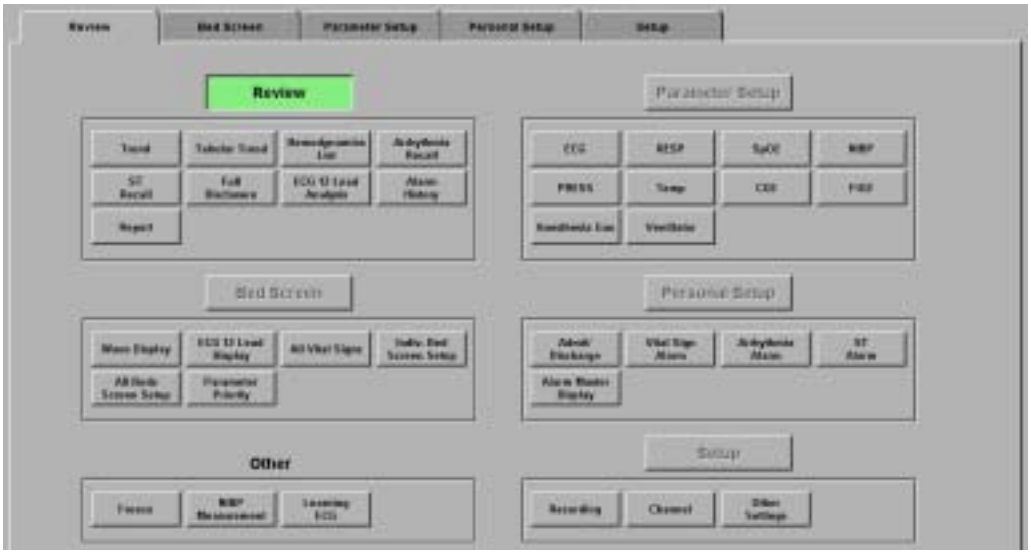
2. Enter the password.

The password is displayed as ****.

3. Touch “Function Keys”. The Function Keys window opens.

4. Touch the tab of a function key you want to assign a function or window to. The setting window opens.

5. Touch the key of the desired function or window.



Setting Date & Time

Set the date and time displayed at the upper right of the screen.

NOTE

Changing the date and time affects the entire network.

1. Touch “System Setup” to display the System Setup screen.

2. Enter the password.

The password is displayed as ****.

3. Touch “Date & Time”. The Date & Time window opens.

4. Touch the item you want to set (Year, Month, Day, Hour, Minute). A keyboard appears on the screen.

5. Enter the desired value and then touch “ENTER”. A message window to confirm the change appears. Repeat this step for other items.

6. After you set all date and time items, touch “Set”.

NOTE

If you change to another window or screen without touching “Set”, the new value is lost.

7. Touch “Yes” to register the settings.

Maintenance

On this window, you can confirm which instruments are connected on the network. Instruments in the network whose power is turned on are displayed. Confirm the number of instruments. You can also change the password to access some windows of the System Setup.

Confirming Instruments Connected on the Network

1. Touch “System Setup” to display the System Setup screen.

2. Enter the password.

The password is displayed as ****.

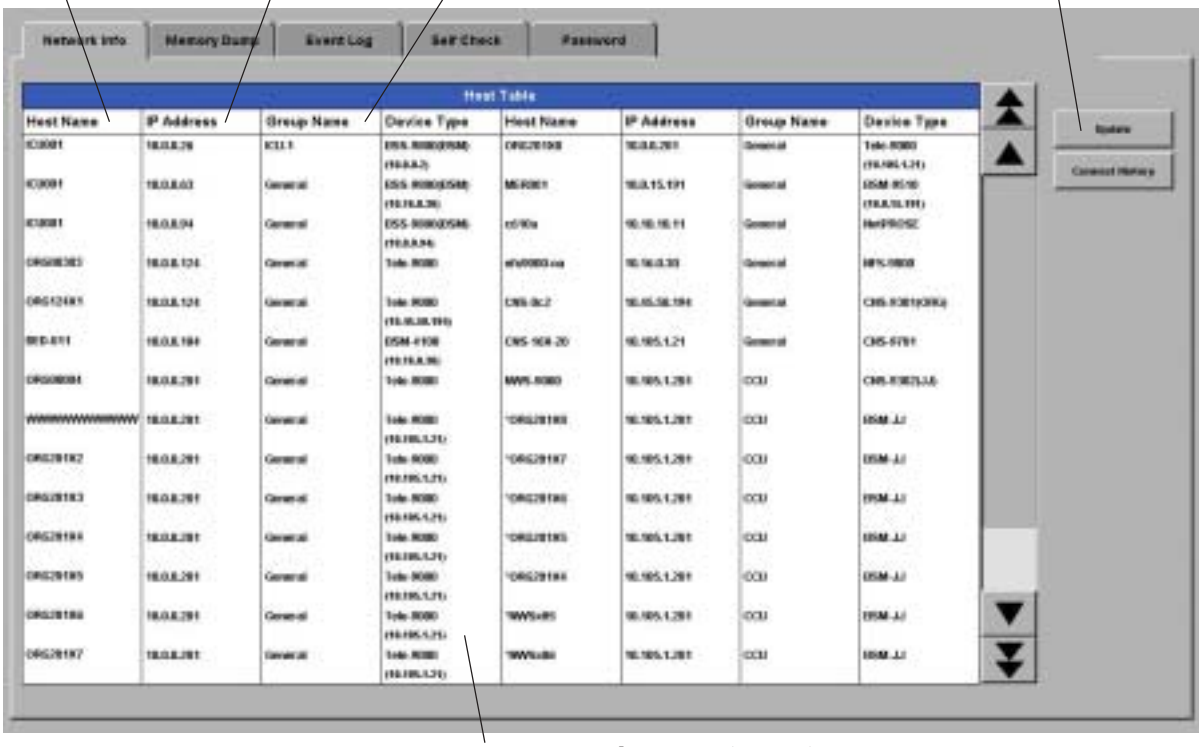
3. Touch “Maintenance”. The Maintenance window opens and network information is displayed.

Instrument’s name (bed name or CNS name)

IP address

Group name

Touch to reload the latest information



Manual setting of a central monitor’s IP address is done on Windows 2000. Refer to the CNS-9701 installation guide.

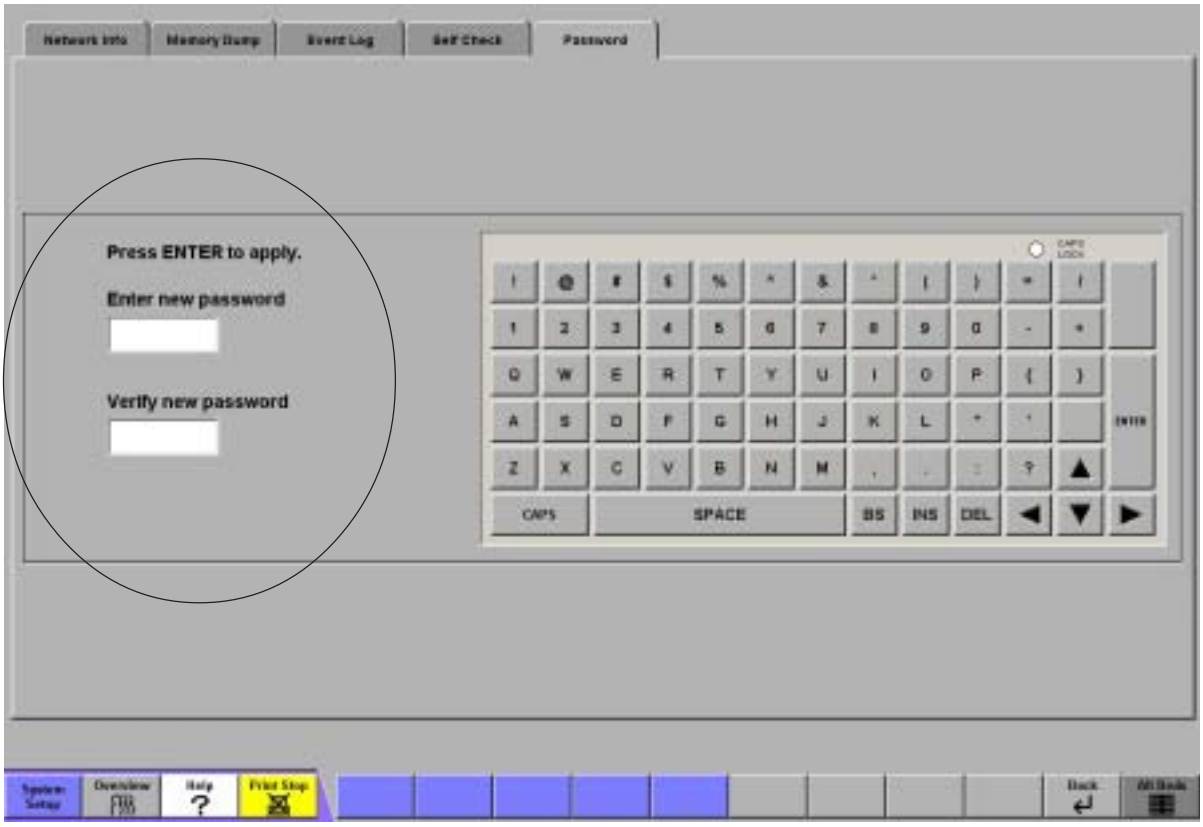
CNS-XXXX: Central monitor (system)
BSM-XXXX: Bedside monitor
Tele-9000: beds whose data is received via the ORG-9200/9700 multiple patient receiver or transmitter.
(An IP address in parenthesis is the address where the bed’s data is saved.)

Changing the Password

To access some windows of the System Setup, you need a password. You can set a password which consists of four numbers. The factory default setting is “1234”, but we recommend that you change this password.

1. On the Maintenance window of the System Setup, touch “Password”. The setting window opens.

2. In the “Enter new password” box, enter a new password with the keyboard on the screen and touch “ENTER”.



3. Enter the password again in the “Verify new password” box and touch “ENTER”.

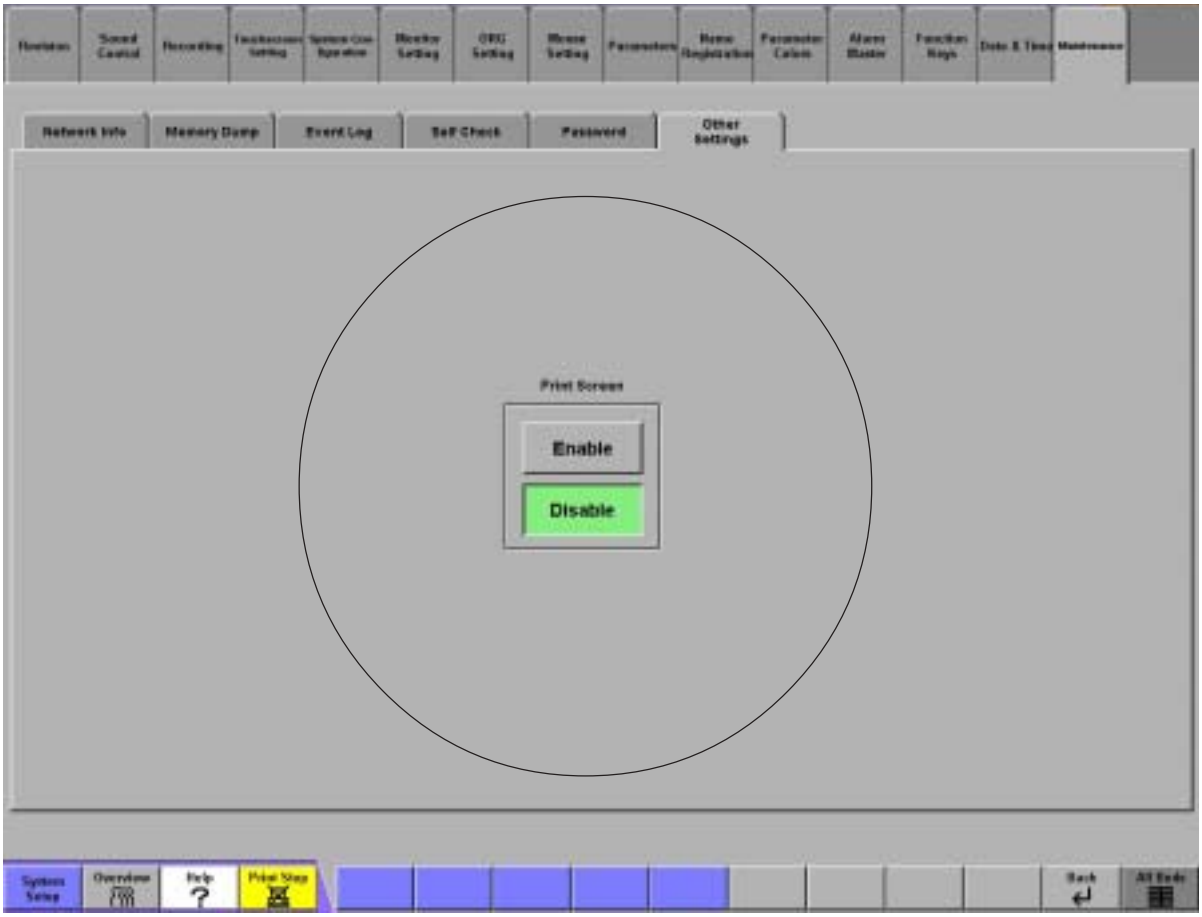
Enabling or Disabling Screen Hard Copy Printing

1. Touch “System Setup” to display the System Setup screen.

2. Enter the password.

The password is displayed as ****.

3. Touch “Maintenance”. The Maintenance window opens.
4. Touch “Other Setting”. The Other Setting window opens.
5. Touch “Enable” or “Disable”. The factory default setting is “Disable”.



Section 5 Admitting/Discharging Patients

Admitting a Patient 5.1
Patient Attribute Information List 5.2
Discharging a Patient 5.3
Selecting Discharge Mode or Delete Data Mode 5.4
Temporarily Discharging the Patient 5.5
Resume Monitoring 5.6
Transferring a Patient to a Different Bedside Monitor 5.7
Changing the Receiving Channel Number 5.10

Admitting a Patient

After turning on the central monitor, admit a patient on the Admit/Discharge window. When admitting a patient, enter the patient attribute information on this window. The central monitor starts monitoring after signal connection and central monitor start-up is complete.

CAUTION

When admitting a new patient, first delete all data of the previous patient. Otherwise, the data of the previous patient and new patient will be mixed together and cause misunderstanding of the patient history.

NOTE

This operation can only be performed for monitored beds whose data is saved in this central monitor.

1. Touch “Off” on the All Beds screen or the basic information area of the bed you are going to admit a patient in. The Admit/Discharge window opens.

2. Touch “Admit”.

3. Enter the patient attribute information. First touch the item you want to enter and then enter information from the keyboard on the screen or the keyboard.

4. Touch “All Beds” to return to the All Beds screen.

Patient Attribute Information List

Item	Description
Name	Up to 32 alphanumeric characters
ID	UP to 16 alphanumeric characters
Blood type	A^-, A^+, B^-, B^+, AB^-, AB^+, O^-, O^+, unknown
Sex	Male, Female, unknown
Birth Date	Mon-Day-Year
Age	0 year 0 month to 127 years 11 months Automatically calculated when the birth date is entered.
Height*	0.1 to 299.9 cm / 0 to 9 ft, 0.0 to 11.9 inch
Weight*	0.1 to 449.9 kg / 0.1 to 654.9 lb
BSA	Automatically calculated when the height and weight are entered.
Physician	Up to 20 alphanumeric characters
Diagnosis	Up to 40 alphanumeric characters, maximum 5 lines
Note	Up to 40 alphanumeric characters

* For the height and weight, you can switch inch/cm and lb/kg at the System Configuration window of the System Setup.

NOTE

- **The ID, physician or diagnosis cannot be seen at the bedside monitor.**
- **The BSS-9800 bedside station and BSS-9510 bedside monitor do not include physician's name and diagnosis in the patient information. Therefore, for these monitors, if you enter "Physician" and "Diagnosis" at the central monitor, these items are deleted.**

Discharging a Patient

When the admitted patient no longer needs to be monitored, discharge the patient. Discharging the patient deletes all the patient data and ends monitoring of the patient at the central monitor.

For the discharged beds:

- "Off" is displayed.
- No waveform is displayed.
- No alarm function
- No data is acquired and stored.

CAUTION

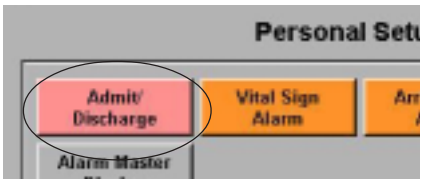
When admitting a new patient, first delete all data of the previous patient. Otherwise, the data of the previous patient and new patient will be mixed together and cause misunderstanding of the patient history.

NOTE

This operation can only be performed for monitored beds whose data is saved in this central monitor.

1. Touch the basic information area of the bed you are going to discharge a patient from.

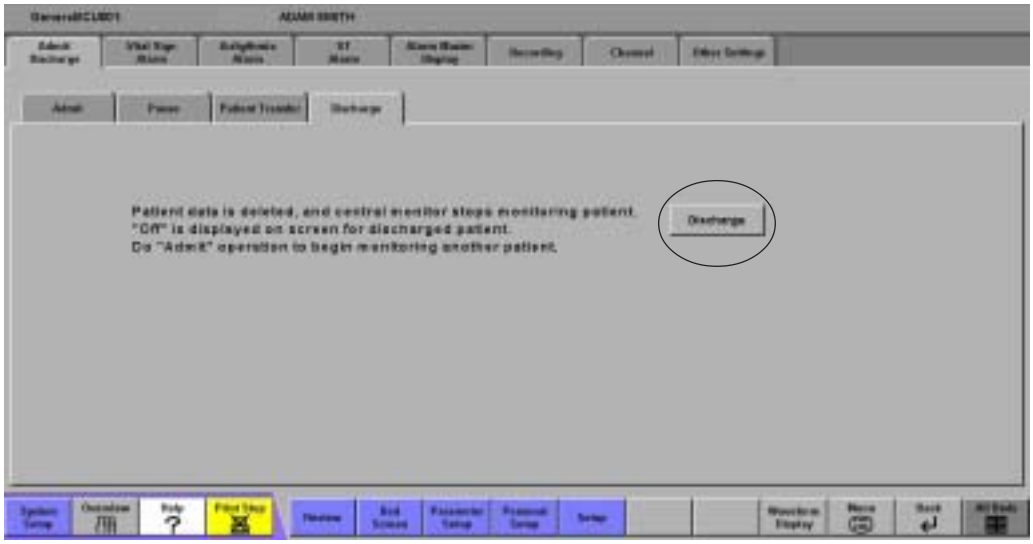
2. Touch "Menu" to display the Menu screen.



3. Touch "Admit/Discharge" to display the Admit/Discharge window.

4. Touch "Discharge" to display the Discharge window.

5. Touch “Discharge”. The message window to confirm discharge appears.


Patient data is deleted, and central monitor stops monitoring patient.
"Off" is displayed on screen for discharged patient.
Do "Admit" operation to begin monitoring another patient.
Discharge

6. Touch “Yes”. All data for the patient is deleted.
7. Touch “All Beds” to return to the All Beds screen.

Selecting Discharge Mode or Delete Data Mode

There are two modes for discharging operation. You can select either one at the System Configuration window of the System Setup.

- Discharge mode: When “Discharge” is touched, all patient data is deleted, the bed changes to “Off”, and monitoring ends. To restart monitoring, do the admitting operation.
- Delete Data mode: When “Delete Data” is touched, all patient data is deleted. The bed does not change to “Off” and it continues to be monitored.

Temporarily Discharging the Patient

When the patient leaves the room and the data cannot be sent to the central monitor, you can stop monitoring a patient without deleting the patient data and settings. Temporary discharge stops displaying measurement values, alarm function and data saving for review windows without losing patient information and settings. During temporary discharge, a message, which you can edit, is displayed on the bed.

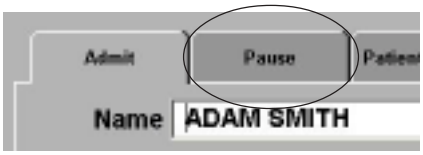
NOTE

This operation can only be done at the central monitor where the bed's data is saved.

1. Touch the basic information area of the bed for which you are going to temporarily discharge a patient.

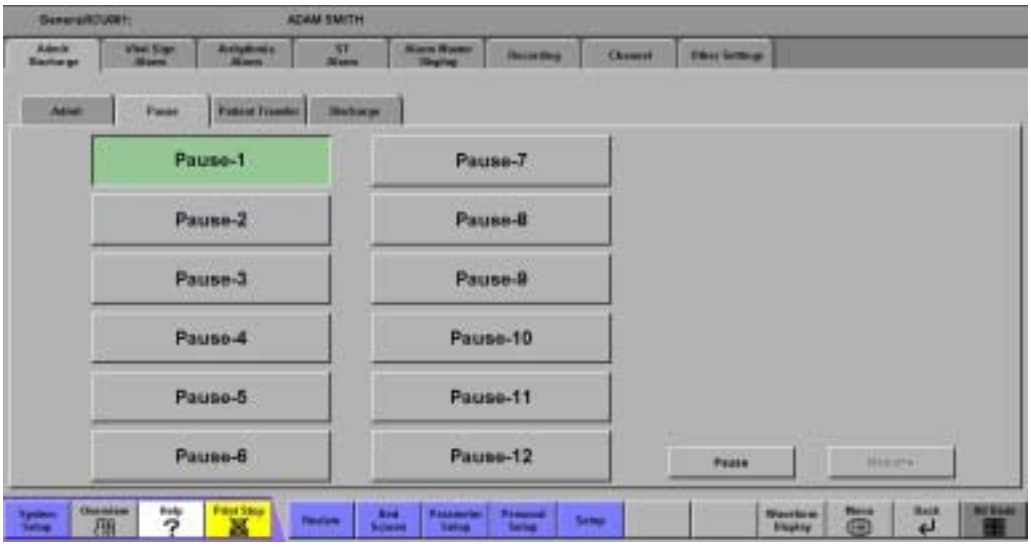
2. Touch "Menu" to display the Menu screen.

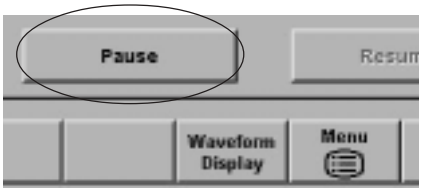
3. Touch "Admit/Discharge" to display the Admit/Discharge window.



4. Touch "Pause" to display the Pause window.

5. Touch the message you want to display during temporary discharge.





6. Touch “Pause”. Monitoring stops and the selected message appears on the screen.

7. Touch “All Beds” to return to the All Beds screen.

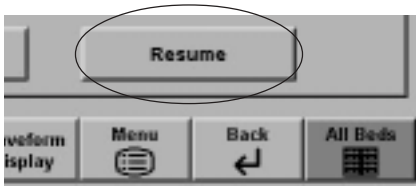
Resume Monitoring

WARNING

When a temporarily discharged patient comes back, resume monitoring for the patient. During temporary discharge, there is no display of measurement values, alarm function and data saving.

To resume monitoring of the patient who was temporarily discharged:

1. Touch “Temporary Discharge” on the All Beds screen or on the basic information area. The Pause window opens.



2. Touch “Resume”. The monitoring resumes.

When the pause period is set at Auto Resume After Pause on the System Configuration window of the System Setup and you restart monitoring patient at the bedside monitor (transmitter) and monitoring continues for as long as the pause period, the temporary discharge automatically releases and monitoring resumes at the central monitor. The factory default pause period is 3 min.

Transferring a Patient to a Different Bedside Monitor

The Admit/Discharge window allows you to transfer patient data from the current bed to any other bed in the patient monitoring network. The data that can be transferred depends on the network composition.

Data and settings which can be transferred are:

- Patient information
- Alarm settings
- Trend data
- Hemodynamics list data
- Arrhythmia recall data
- ST recall data
- ECG 12 lead analysis file
  (ECG 12 lead analysis files can only be transferred between other CNS-9701 central monitors and connected bedside monitors whose data is saved in a CNS-9701 central monitor.)
- Full disclosure waveform
- Alarm History
  (The alarm history data can only be transferred in a CNS-9701 central monitor.)

NOTE

After transferring a patient, all data other than the data listed above are deleted from the central monitor and the bedside monitor.

CAUTION

- **Keep the original bedside monitor and the destination bedside monitor power on and connected to the network until the transfer completes. Otherwise transfer fails and the data is lost. After transfer, confirm that the data was correctly transferred to the destination bedside monitor.**
- **When the patient is transferred more than once between different central monitors in the network, the data saved on the original central monitor is deleted.**

NOTE

- **Before transferring data, check that the monitors for the destination bed and the original bed are both turned on.**
- **Data before the patient transfer is saved in the original central monitor. To see the data before the transfer, keep the power of the original central monitor on.**
- **This operation can only be performed for the monitored beds whose data is saved in this central monitor.**
- **Note in the patient attribute is deleted after patient transfers.**

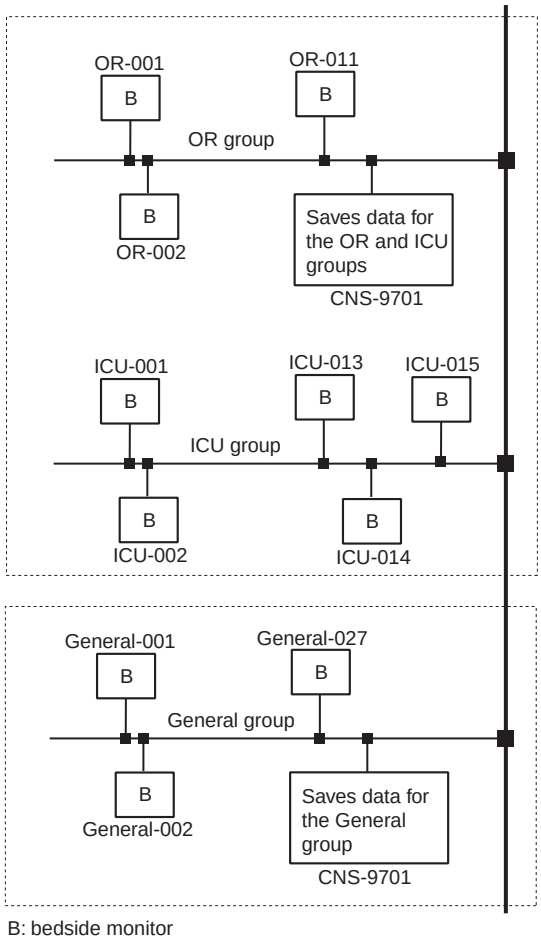
A “CNS group” consists of a central monitor and all the monitors whose data is stored on that central monitor.

When a patient is transferred between bedside monitors in the same CNS group, the data can be transferred any number of times. For example, when a patient is transferred from monitor OR-001 → ICU-001 → ICU-014, data can be transferred between monitors. See the diagram below.

When a patient is transferred between bedside monitors in different CNS groups, the data from the original (first) central monitor is transferred to the second central monitor and the data is saved on the first and second central monitors. If the data is transferred to a third central monitor, the data is saved in the second and third central monitors and deleted from the first central monitor.

For example, when a patient is transferred from monitor OR-001 → General-001 → ICU-015, the data saved in OR-001 transferred and displayed on General-001, but data saved in OR-001 is lost when the patient is transferred from General-001 to ICU-015 and cannot be displayed on ICU-015.

When a patient is transferred from monitor OR-001 → ICU-001 → General-001, the data saved in the original CNS (OR-001 and ICU-001 data) is transferred and displayed on General-001. If the patient is transferred from General-001 to General-027, the data saved in the original central monitor (for OR-001 and ICU-001) is deleted from the original central monitor and not transferred to General-027. The data cannot be displayed on General-027.

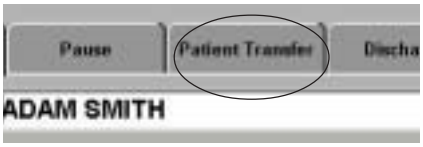


B: bedside monitor

1. Touch the basic information area of the bed you want to transfer.

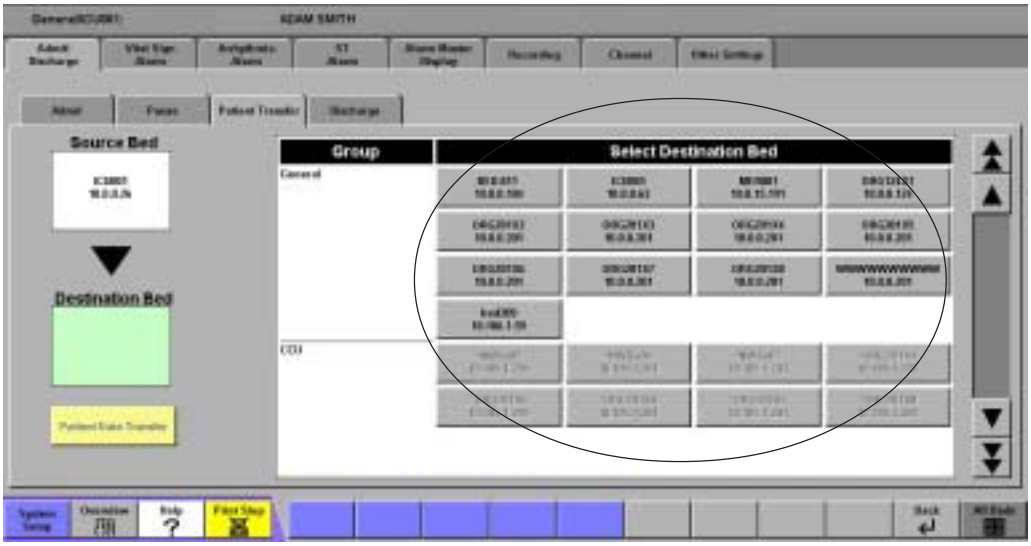
2. Touch “Menu” to display the Menu screen.

3. Touch “Admit/Discharge” to display the Admit/Discharge window.



4. Touch “Patient Transfer” to display the Patient Transfer window.

5. Touch a bed in Select Destination Bed to select the bed the patient is transferred to.



6. Touch “Patient Data Transfer”. The message window to confirm the transfer appears.

7. Touch ”Yes”.

NOTE

Before touching “Yes”, confirm the bed you want to transfer and the destination bed by the bed name.

8. Touch “All Beds” to return to the All Beds screen. The original bed becomes discharged and the destination bed becomes admitted.

Changing the Receiving Channel Number

When receiving data from a transmitter through an ORG-9200 multiple patient receiver, the transmitter channel must be set on the central monitor. Otherwise no signal will be received by the central monitor.

WARNING

- **Check that the channel number of the appropriate transmitter is displayed on the central monitor screen. Otherwise data of a different patient will be monitored or no signal will be received by the central monitor.**
- **Whenever you change the transmitter, you must change the channel number on the central monitor.**

CAUTION

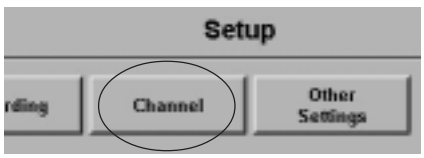
When you change the receiving channel to monitor a new patient, first delete all data of the previous patient. Otherwise, the data of the previous patient and new patient will be mixed together and cause misunderstanding of the patient history.

NOTE

- **The receiving channel number is set at the moment you confirm "Yes" or "No" of all data deletion.**
- **The receiving channel can be set only when receiving data from a transmitter through a multiple patient receiver.**
- **This operation can only be performed for monitored beds whose data is saved in this central monitor.**

1. Touch the basic information area of the bed you want to set the channel for.

2. Touch "Menu" to display the Menu screen.



3. Touch "Channel" to display the Channel window of the Setup.

4. Enter the transmitter channel number.

5. Touch “Set”. A message window to confirm all data deletion appears.

NOTE

- **You cannot set a channel number which is not included in the connected multiple patient receiver.**
- **Do not set receiving channels which interfere with each other. Otherwise, the “There is a possibility of channel interference.” message appears. If you use those channels, signals may be difficult to receive by the multiple patient receiver.**

6. Touch “Yes” or “No”.
   Yes: All data is deleted. Select “Yes” when you will monitor a new patient.
   No: Data is not deleted. Select “No” when you will use another transmitter to monitor the same patient.

7. Touch “All Beds” to return to the All Beds screen.

8. Confirm that the correct channel number is displayed on the screen.

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WARNING

- **Do not adjust the sound volume at the display unit. If you decrease the display unit volume to the minimum, there is no alarm sound.**
- **When the Alarm Suspend key on the transmitter is pressed, all alarm functions for the patient are suspended.**
- **Even if the alarm is set to ON, there is no arrhythmia alarm when arrhythmia analysis is turned OFF at the bedside monitor and/or central monitor.**
- **Before you start monitoring a new patient, confirm alarm settings. When monitoring via ORG-9200/9700 multiple patient receiver, the alarm settings return to the Alarm Master 1 settings when a bed is discharged or data is deleted.**
- **Securely connect the sound cable. There is no sound if the cable comes off.**

CAUTION

- **When the upper or lower alarm limit is set to OFF, there will be no upper or lower alarm for that limit. When it is set to OFF, frequently observe the patient.**
- **Alarm does not occur for an arrhythmia whose alarm is set to OFF. There is no indication that the alarm is set to OFF. Be careful when you set the alarm to OFF.**

Overview of Alarms

The table below shows which alarm functions are available on which instrument.

Alarm functions	Central Monitor	Bedside Monitor	Transmitter through Multiple Patient Receiver
Setting Alarms • Vital sign alarm • ST alarm • Arrhythmia alarm	Available (When the monitored bed is a bedside monitor, settings at the central monitor and bedside monitor are synchronized.)	Available	Not available (You can set the settings on the central monitor.)
Judging when an alarm condition exists and what parameters are alarming	No (Displays alarms from bedside monitors and multi patient receivers)	Yes	The multiple patient receiver judges and the transmitter generates the CALL alarm.
Silencing/suspending alarms	For a bedside monitor: same function as the bedside monitor For a multiple patient receiver: temporarily silence current alarms	Temporarily silence current alarms 8000 series beds: temporarily suspend all alarm functions	Not available at the multiple patient receiver. Pressing the alarm suspend key on the transmitter suspends all alarm functions for 3 minutes.
Turning all alarm functions On/Off	Not available	Depends on the bedside monitor model	Not available
Alarm indication	Sound, screen indication, recording	Sound, blinking lamp, screen indication, recording	No indication

NOTE

For the OEC-6000 and 8000 series bedside monitors, the central monitor generates alarm sound and indication and starts alarm recording according to the alarm judgement on the bedside monitor.

Alarm Types

Unit on which the alarm occurs	Alarm type	Cause
Central monitor	Technical alarm	When problems occur on the central monitor or network.
Monitored bed	Vital sign alarm	When vital sign data of each parameter exceeds preset value of the upper or lower alarm limit.
	ST alarm	When ST level exceeds preset value of the upper or lower alarm limit.
	Arrhythmia alarm	When an arrhythmia is detected.
	Technical alarm	When problems occur on the monitored bed and its external instruments.
Overview bed	Overview bed alarm	When problems occur on the currently selected overview bed and its external instruments.

Alarm Level and Indication

Alarm Level

There are three alarm levels.

CRISIS: Patient is in critical condition and patient life may be at risk. Immediate action must be taken. Electrodes or probe off, or incorrect lead or other cable connections may also cause this alarm.

WARNING: Patient is in critical condition. Prompt action should be taken. Electrodes or probe off, or incorrect lead or other cable connections may also cause this alarm.

ADVISORY: Electrodes, probe, cuff, lead and other cable connections or settings on the monitor are not appropriate for accurate measurement. Prompt action should be taken.

Alarm Indication

The central monitor can indicate alarms both visually and audibly:

- Alarm sound (see the table below)
- Alarm message on the screen
- Highlighted vital sign numeric data and corresponding alarm message on the screen (see the table below)
- Alarm recording starts

Alarm level	Alarm sound	Alarm message	Alarm recording
Crisis	Continuous “pips”	Highlighted in red	Automatically starts when an alarm occurs. (Recording On/Off can be set for each alarm.)
Warning	Continuous “bing bong”	Highlighted in orange	
Advisory	“Bong”	Highlighted in yellow	
Message	None	Highlighted in white	

Alarms on Each Screen

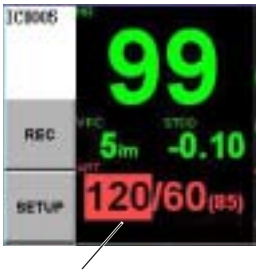
Alarms for Monitored Beds

Vital signs alarm/ST alarm

The Vital signs alarm/ST alarm occurs when a measured value exceeds the preset upper/lower limit for the parameter. The measured value is highlighted. When an alarm occurs for a parameter which is not displayed on the screen, the displayed parameter changes to the alarmed parameter and is highlighted.

Display examples

With numeric display



The numeric data is highlighted. The alarm message is displayed in the color according to the alarm level.

Without numeric display

The alarm message is displayed in the color according to the alarm level. When several alarms occur simultaneously, only the highest priority alarm is displayed.

Arrhythmia alarm

The Arrhythmia alarm occurs when an arrhythmia occurs. A highlighted arrhythmia name in the color according to the level is displayed in the bed display area. When several alarms occur simultaneously, only the highest priority alarm is displayed.

NOTE

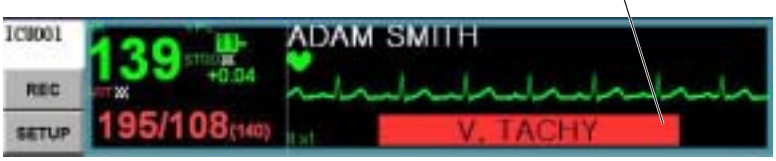
A message is not displayed when:

- **Alarm functions are set to OFF on the bedside monitor.**
- **Alarm for the arrhythmia is set to OFF.**

Display examples

All Beds screen

Highlighted arrhythmia name in the color according to the level



Individual Bed screen

Basic information area

Highlighted arrhythmia name in the color according to the level

When the detection conditions for “FREQ VPC” are satisfied, the VPC is highlighted.

When several alarms occur simultaneously, only the highest priority alarm is displayed.

Technical alarm

When an alarm about instrumental abnormality occurs, a highlighted alarm message in the color according to the level is displayed in the bed display area.

Display examples

All Beds screen

Individual Bed screen

When several alarms occur simultaneously, only the highest priority alarm is displayed. The alarm message is highlighted in the color according to the level.

When an alarm about an individual parameter occurs, the highlighted alarm message in the color according to the level is displayed.
When an alarm occurs for a parameter which is not displayed on the screen, the displayed parameter changes to the alarmed parameter and is highlighted.

Display examples

With numeric display

The highlighted alarm message in the color according to the level is displayed at the measurement value.

Without numeric display

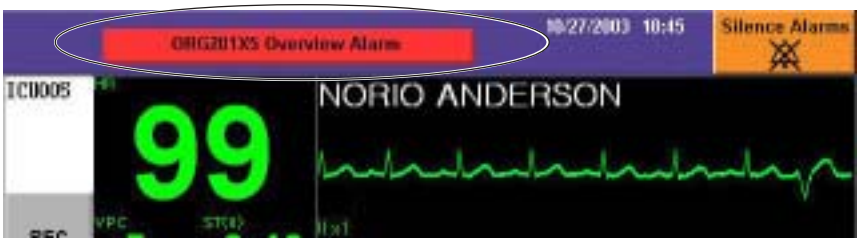
The alarm message is displayed in the color according to the level. When several alarms occur simultaneously, only the highest priority alarm is displayed.

Alarms for Overview Bed

Alarms for the currently displayed overview bed are displayed on the Overview Bed screen. The alarm indication and alarm level is the same as for monitored beds.

The overview bed alarm cannot be silenced by touching “Silence Alarms”. To stop the overview bed alarm, touch “Stop monitoring” on the Overview Bed Menu screen.

When a screen other than the Overview Bed Screen is displayed and an alarm occurs in the currently selected overview bed, the alarm message is displayed in red at the top of the screen.



Alarms for the Central Monitor and WS-971R Recorder Unit

Alarm messages for the central monitor and WS-971R recorder unit are displayed at the top of the screen. Some messages also have sound.

Temporarily Silencing or Suspending Alarms

You can temporarily silence or suspend alarms by touching “Silence Alarms”. Whether alarms are silenced or suspended depends on the bed type:

- For beds which are directly connected to the network, currently occurring alarms are temporarily silenced.
- For 8000 series beds, all alarm functions for the bed are temporarily suspended.

Temporarily Silencing Currently Occurring Alarms

NOTE

This function is only for the beds directly connected to the network.

At the central monitor, you can silence alarms occurring at the monitored bed. When you silence alarms at the central monitor, they are also silenced at the bedside monitor. Also, when you silence alarms at the bedside monitor, they are also silenced at the central monitor.

To silence the currently occurring alarms, touch “Silence Alarms”.

During alarm silence,

- The alarm silence mark and the remaining minutes ₂ are displayed in the display area of the silenced bed. (For technical alarms, these are not displayed.)
- The alarm sound is silenced
- The visual indication such as an alarm message remains.

Alarms resume when:

- For vital signs alarms, ST alarms and arrhythmia alarms, the cause of alarm continues after the alarm silence ends.
- A different alarm occurs.
- The cause of alarm disappears during alarm silence, then the same alarm occurs again.

Alarm Silence Time

Bedside monitor:

Alarm silence time is the setting on the bedside monitor.

Bed via multiple patient receiver:

Alarm silence time is set on the System Configuration window of the System Setup on the central monitor.

Temporarily Suspending All Alarms

NOTE

This function is only for the 8000 series beds.

For the 8000 series beds, refer to Section 1.

All alarm functions are temporarily suspended for the currently alarmed bed. During alarm suspend, there is no alarm sound, no alarm message display and no alarm recording.

To suspend all alarm functions on a currently alarmed bed, touch “Silence Alarms”. During alarm suspend, the alarm suspend mark with the remaining minutes indication ₂ and the “Alarm Suspended” message are displayed in the display area of the suspended bed.

Alarm Suspend Time

Bedside monitor:

Alarm suspend time is the setting on the bedside monitor.

Suspending All Alarms at the Transmitter

WARNING

When you press the Silence Alarms key on the transmitter, there is no alarm for that transmitter. When you press the Silence Alarms key, confirm the condition of the patient with your own eyes.

By pressing the Silence Alarms key on the transmitter, you can suspend all alarms before occurrence. This is useful to prevent unnecessary alarms during electrode replacement, treatments and so on.

When the Silence Alarms key on the transmitter is pressed, all alarm function for the patient is suspended for 3 minutes. The alarm suspend mark is displayed in the display area of the patient on the All Beds screen, Individual Bed screen and basic information area of each screen.

Alarm Control Marks

Mark Description

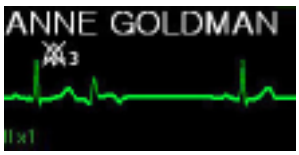
When certain alarm functions are not available, an alarm control mark is displayed on the display area for the patient.

Vital sign alarm off mark

This mark is displayed above each parameter name when both the upper and lower limits of the vital sign alarms are set to OFF.

Alarm off mark

This mark is displayed when all alarms are turned off on the bedside monitor.



Alarm silence mark / Alarm suspend mark

This mark is displayed when a currently occurring alarm is temporarily silenced or when all alarms are temporarily suspended. The function differs according to the bed type. Remaining minutes are indicated beside the bell.

Alarm silence mark (from the transmitter)

This mark is displayed when the Alarm Suspend key is pressed on the transmitter. All alarm functions for the patient are suspended for 3 minutes.

Alarm recording off mark

This mark is displayed when any alarm recording (vital sign alarm recording, arrhythmia alarm recording, or ST alarm recording) is set to OFF.

Priority of Alarm Control Marks

If more than one alarm control condition exists at the same time, only the highest priority mark is displayed.

The priority, from high to low is:

1. Alarm off mark
2. Alarm silence mark/Alarm suspend mark
3. Alarm silence mark from the transmitter
4. Alarm recording off mark

Turning the Vital Sign Alarm Off Mark Display On/Off

When both the upper and lower limits of a vital sign alarm are set to OFF, the vital sign alarm off mark appears beside the parameter name.

On the System Configuration window of the System Setup, you can set whether or not the vital sign alarm off mark is displayed.

NOTE

Some bedside monitor models allow you to set the conditions to display the vital sign alarm off mark on the bedside monitor screen. The vital sign alarm off mark is displayed on the central monitor depending on the setup of the bedside monitor.

Alarm Recording

Alarm Recording Modes

NOTE

When all alarms are set to OFF on the bedside monitor, the alarm recording for the bed is not performed.

Alarm recording is categorized into the following three modes.

- Vital sign alarm recording
- ST alarm recording
- Arrhythmia alarm recording

Each alarm recording automatically starts when the alarm occurs.

Overview of Alarm Recording

Recording device

Optional WS-971R recorder unit

Recording waveforms

Waveforms displayed on the All Beds screen at the alarm occurrence

Recording time

Select from 10, 20, 30, 40, 50, 60 seconds. Set at “Alarm/Call Recording” on the Recording window of the System Setup.

Recording speed

Select 25 mm/s or 50 mm/s. Set “Recording Sweep Speed” at “Other”on the Recording window of the Setup.

Sensitivity on the recording paper

Refer to Section 10.

Necessary Settings for Alarm Recording

NOTE

Recording settings set on the central monitor affect the WS-971R recorder unit. Recording settings set on the bedside monitor affect only the built-in recorder of the bedside monitor.

There are two setting windows to turn alarm recording on or off. Changing settings on one window changes the settings on the other window.

- ON/OFF key at “Recording” on the each alarm window.
- ON/OFF key for each alarm recording at “Alarm Recording” on the Recording window of the Setup.

Vital sign alarm recording

- Set “Vital Sign Record” to “ON” on the Vital Sign Alarm window of the Personal Setup or set “Vitalsign Alarm Record” to “ON” at “Alarm Recording” on the Recording window of the Setup.
  The settings on both windows are synchronized. Changing one changes the other.
- Set the upper and lower alarm limits of each parameter on the Vital Sign Alarm window.

Arrhythmia alarm recording

NOTE

When the following necessary settings for automatic alarm recording are set, the arrhythmia alarm recording starts even when there is no alarm indication on the central monitor.

- Set “Record” of each arrhythmia which needs recording to ON on the Arrhythmia Alarm window of the Setup.
- Set “Arrhythmia Analysis” to ON on the ECG window of the Parameter Setup. (Only for beds receiving transmitter data via a multiple patient receiver)

ST alarm recording

- Set “ST Alarm Record” to “ON” on the ST Alarm window of the Personal Setup or set “ST Alarm Record” to “ON” at the Alarm Recording window of the Recording window of the Setup. The settings on both windows are synchronized. Changing one changes the other.
- Set the upper and lower alarm limits on the ST Alarm window.

Starting Automatic Alarm Recording

Starting Automatic Alarm Recording

When necessary settings for automatic alarm recording are set, the alarm recording automatically starts when an alarm occurs.

NOTE

When the necessary settings for automatic alarm recording are set, the arrhythmia alarm recording starts even in situations where there is no alarm indication on the central monitor such as:

- **All alarm function is set to OFF at the bedside monitor.**
- **An arrhythmia occurs whose alarm setting (“Alarm”) is set to OFF on the Arrhythmia Alarm setting window.**

Stopping Automatic Alarm Recording

Touch “REC” on the All Beds screen or basic information area.

Setting Alarms

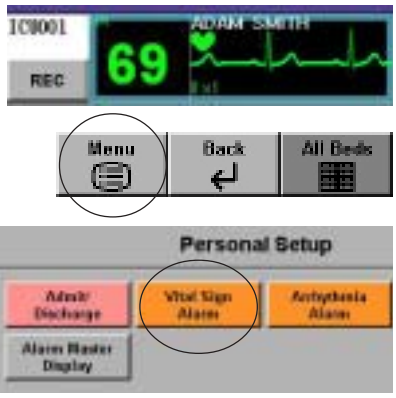
NOTE

- **Do not change alarm settings on the bedside monitor and the central monitor simultaneously.**
- **When monitoring via ORG-9200/9700 multi patient receiver, the Alarm Master 1 settings are automatically copied when you discharge or delete data.**

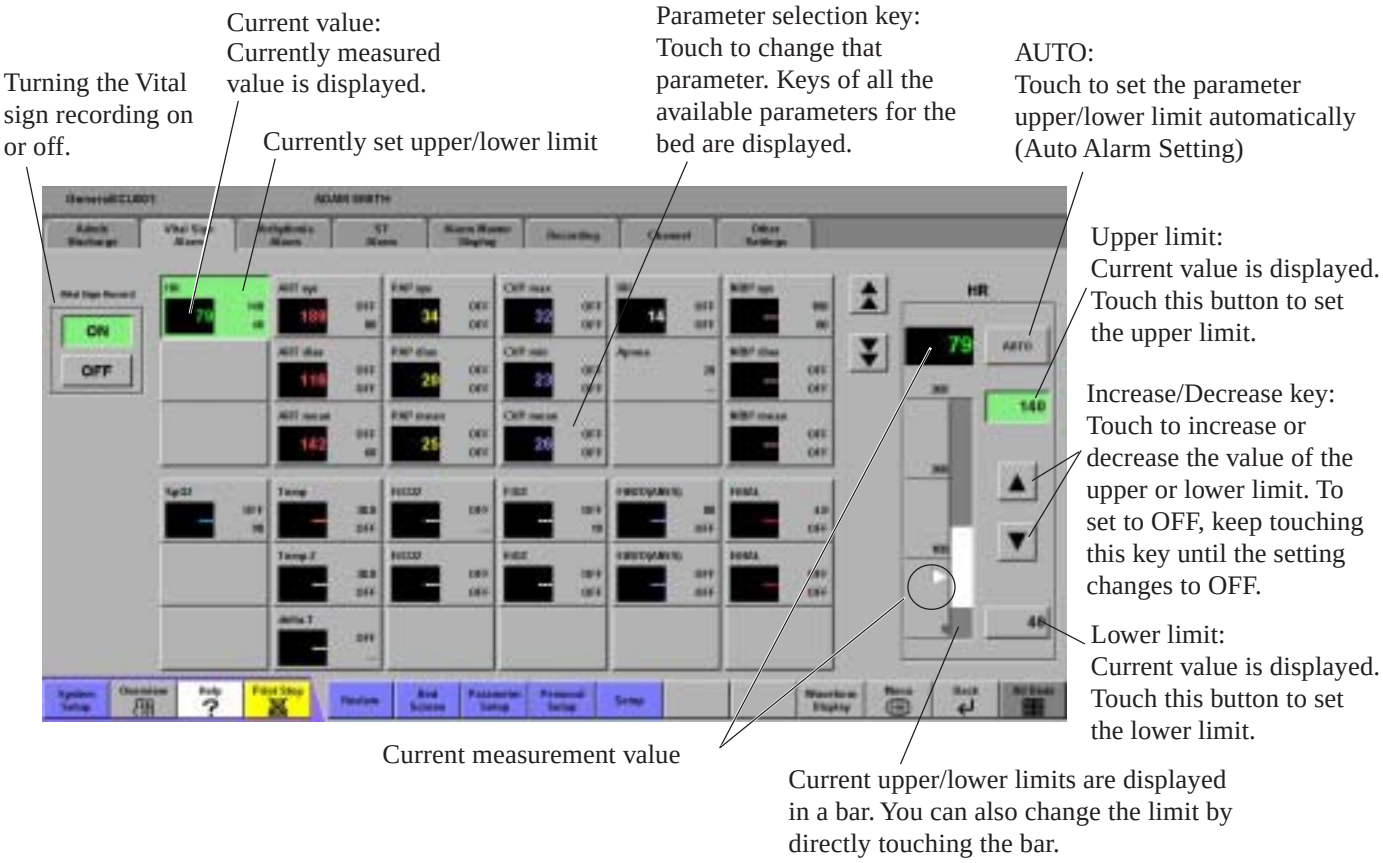
The following alarms need to be set for each monitored bed.

- Vital sign alarm setting
- ST alarm setting
- Arrhythmia alarm setting

Setting Vital Sign Alarms



1. Touch the basic information area of the bed you are going to set alarms for. The Individual Bed screen for the bed opens.
2. Touch “Menu” to display the Menu screen.
3. Touch “Vital Sign Alarm” to display the Vital Sign Alarm window.
4. Set the necessary settings.


Turning the Vital sign recording on or off.
Current value: Currently measured value is displayed.
Currently set upper/lower limit
Parameter selection key: Touch to change that parameter. Keys of all the available parameters for the bed are displayed.
AUTO: Touch to set the parameter upper/lower limit automatically (Auto Alarm Setting)
Upper limit: Current value is displayed. Touch this button to set the upper limit.
Increase/Decrease key: Touch to increase or decrease the value of the upper or lower limit. To set to OFF, keep touching this key until the setting changes to OFF.
Lower limit: Current value is displayed. Touch this button to set the lower limit.
Current measurement value
Current upper/lower limits are displayed in a bar. You can also change the limit by directly touching the bar.
ON
OFF
HR
79
AUTO
140
46

5. Touch “All Beds” to return to the All Beds screen.

Alarm Limits Range

Alarm Item		Lower Limit*	Upper Limit*	Step	Unit
ECG	Heart rate	15 to 295	20 to 300	5	beat/min
Pulse rate		30 to 245	35 to 250	5	count/min
Resp	Resp rate	0 to 148	2 to 150	2	count/min
	APNEA	---	5 to 40	5	s
NIBP(S/D/M)		10 to 255	15 to 260	5	mmHg
		1.0 to 34.5	1.5 to 35.0	0.5	kPa
SpO_2	SpO_2, SpO_2-2	50 to 99	51 to 100**	1	%
	delta SpO_2	1 to 98	2 to 99**	1	%
IBP (S/D/M)	AO, ART, ART-2, RAD, FEM, DORS, PRESS, PRESS-2 to 8	0 to 298	2 to 300	2	mmHg
	CVP, RAP, PAP, RVP, LAP, LVP, UA, UV, ICP, ICP-2 to 4	0.0 to 39.5	0.5 to 40.0	0.5	kPa
Temp		0.0 to 44.9	0.1 to 45.0	0.1	°C
		32.2 to 112.8	32.4 to 113.0	0.2	°F
delta T	Delta T,	0.0 to 44.9	0.1 to 45.0	0.1	°C
	delta T-2 to 4	0.0 to 112.9	0.1 to 113.0	0.2	°F
Tb		0.0 to 44.9	0.1 to 45.0	0.1	°C
		32.2 to 112.8	32.4 to 113.0	0.2	°F
O_2	FiO_2	18 to 99	19 to 100	1	%
	EtO_2	10 to 99	11 to 100	1	
CO_2	$FiCO_2$	---	1 to 5	1	mmHg
			0.1 to 0.7	0.1	kPa
	$EtCO_2$	1 to 98	2 to 99	1	mmHg
		1.0 to 12.5	1.5 to 13.0	0.5	kPa
N_2O	FiN_2O	0 to 99	1 to 100	1	%
	EtN_2O	0 to 99	1 to 100	1	
HAL	FiHAL	0.0 to 6.9	0.1 to 7.0	0.1	%
	EtHAL	0.0 to 6.9	0.1 to 7.0	0.1	
ISO	FiISO	0.0 to 6.9	0.1 to 7.0	0.1	%
	EtISO	0.0 to 6.9	0.1 to 7.0	0.1	
ENF	FiENF	0.0 to 6.9	0.1 to 7.0	0.1	%
	EtENF	0.0 to 6.9	0.1 to 7.0	0.1	
SEV	FiSEV	0.0 to 6.9	0.1 to 7.0	0.1	%
	EtSEV	0.0 to 6.9	0.1 to 7.0	0.1	
DES	FiDES	0.0 to 19.9	0.1 to 20.0	0.1	%
	EtDES	0.0 to 19.9	0.1 to 20.0	0.1	
SvO_2		30 to 96	31 to 97	1	%

Alarm Item		Lower Limit*	Upper Limit*	Step	Unit
CCO		1.0 to 19.9	1.1 to 20.0	0.1	L/min
Tb (CCO)		0.0 to 44.9	0.1 to 45.0	0.1	°C
		32.2 to 112.8	32.4 to 113.0	0.2	°F
MV		2 to 24	4 to 26	2	L/min
Ppeak		8 to 98	10 to 100	2	cmH_2O
PEEP		2 to 48	4 to 50	2	
$TcPO_2$		0 to 795	5 to 800	5	mmHg
		0 to 109.5	0.5 to 110.0	0.5	kPa
$TcPCO_2$		0 to 195	5 to 200	5	mmHg
		0 to 29.5	0.5 to 30.0	0.5	kPa
BIS		1 to 99	2 to 100	1	%
EEG	SEF1/SEF2	0.5 to 59.5	1.0 to 60.0	0.5	Hz
	TP1/TP2	0.01 to 9.98	0.02 to 9.99	0.01	nW
CNIBP	systole	40 to 235	45 to 240	5	mmHg
	diastole	20 to 175	25 to 180		
	mean	30 to 195	35 to 200		
	systole	5.0 to 31.5	5.5 to 32.0	0.5	kPa
	diastole	2.5 to 23.5	3.0 to 24.0		
	mean	4.0 to 26.5	4.5 to 27.0		

* For the setting range, “OFF” can also be set.

** Some bedside monitors cannot set the upper limits.

Each alarm level depends on bedside monitor types.

Setting vital sign alarms automatically (Auto Alarm Setting)

You can set the upper and lower limits with the Auto Alarm Setting function. In the Auto Alarm Setting function, the upper and lower limits are automatically calculated based on the patient's current vital values. The baseline value for the upper and lower limit calculation is based on the parameter value at the moment the Auto Alarm is set.

To set vital sign alarm upper/lower limits by the Auto Alarm Setting, touch "AUTO".

Following are the calculation formulas.

Alarm Item		Lower Limit*	Upper Limit*	Unit
ECG (Heart rate)		HR × 0.75	HR × 1.25	beat/min
Pulse rate		PR × 0.75	PR × 1.25	count/min
RR	RR	(RR × 0.75) – 4	(RR × 1.25) + 4	count/min
	APNEA	—	60/RR × 2	s
NIBP, CNIBP	sys, dias, mean	(NIBP × 0.75) – 10	(NIBP × 1.25) + 10	mmHg
		(NIBP × 0.75) – 1.3	(NIBP × 1.25) + 1.3	kPa
SpO_2	SpO_2, SpO_2-2	SpO_2 – 5, SpO_2-2 – 5	—	%
	delta SpO_2	—	5	%
IBP (AO, ART, ART-2, RAD, FEM, DORS, PAP, RVP, LVP, UA, UV, PRESS, PRESS-2 to 8)	sys, dias, mean	(IBP × 0.75) – 10	(IBP × 1.25) + 10	mmHg
		(IBP × 0.75) – 1.3	(IBP × 1.25) + 1.3	kPa
IBP (CVP, RAP, LAP, ICP, ICP-2 to 4)	mean	(IBP × 0.75) – 5	(IBP × 1.25) + 5	mmHg
		(IBP × 0.75) – 0.7	(IBP × 1.25) + 0.7	kPa
Temp (Tskin, Tskin-2 to 3, Tcore, Trect, Teso, Ttymp, Tblad, Taxil, Tnaso, TEMP, TEMP-2 to 8)		Temp – 0.5	Temp + 0.5	°C
		Temp – 0.9	Temp + 0.9	°F
delta T (delta T, delta T-2 to 4)		delta T – 0.5	delta T + 0.5	°C
		delta T – 0.9	delta T + 0.9	°F
Tb		Tb – 0.5	Tb + 0.5	°C
		Tb – 0.9	Tb + 0.9	°F
O_2	FiO_2	FiO_2 × 0.9	FiO_2 × 1.1	%
	EtO_2	EtO_2 × 0.75	EtO_2 × 1.25	
CO_2	$FiCO_2$	—	$FiCO_2$ × 1.25	mmHg
			$FiCO_2$ × 1.25	kPa
	$EtCO_2$	$EtCO_2$ × 0.75	$EtCO_2$ × 1.25	mmHg
		$EtCO_2$ × 0.75	$EtCO_2$ × 1.25	kPa
N_2O	FiN_2O	(FiN_2O × 0.8) – 5	(FiN_2O × 1.2) + 5	%
	EtN_2O	(EtN_2O × 0.8) – 5	(EtN_2O × 1.2) + 5	
HAL	FiHAL	(FiHAL × 0.9) – 0.5	(FiHAL × 1.1) + 0.5	%
	EtHAL	(EtHAL × 0.9) – 0.5	(EtHAL × 1.1) + 0.5	
ISO	FiISO	(FiISO × 0.9) – 0.5	(FiISO × 1.1) + 0.5	%
	EtISO	(EtISO × 0.9) – 0.5	(EtISO × 1.1) + 0.5	
ENF	FiENF	(FiENF × 0.9) – 0.5	(FiENF × 1.1) + 0.5	%
	EtENF	(EtENF × 0.9) – 0.5	(EtENF × 1.1) + 0.5	
SEV	FiSEV	(FiSEV × 0.9) – 0.5	(FiSEV × 1.1) + 0.5	%
	EtSEV	(EtSEV × 0.9) – 0.5	(EtSEV × 1.1) + 0.5	

Alarm Item		Lower Limit*	Upper Limit*	Unit
DES	FiDES	(FiDES × 0.8) – 0.5	(FiDES × 1.2) + 0.5	%
	EtDES	(EtDES × 0.8) – 0.5	(EtDES × 1.2) + 0.5	
$S\bar{v}O_2$		$S\bar{v}O_2$ – 5	$S\bar{v}O_2$ + 5	%
CCO		CCO × 0.75	CCO × 1.25	L/min
Tb (CCO)		Tb – 0.5	Tb + 0.5	°C
		Tb – 0.9	Tb + 0.9	°F
MV		MV × 0.75	MV × 1.25	L/min
Ppeak		Ppeak × 0.75	Ppeak × 1.25	cmH_2O
PEEP		PEEP × 0.75	PEEP × 1.25	
tcPO2		tcPO2 × 0.75	tcPO2 × 1.25	mmHg
				kPa
tcPCO2		tcPCO2 × 0.75	tcPCO2 × 1.25	mmHg
				kPa
BIS		---	40	%
EEG	SEF1/SEF2	SEF × 0.75 – 2.0	SEF × 1.25 + 2.0	Hz
	TP1/TP2	TP × 0.75 – 0.20	TP × 1.25 + 0.20	nW

* Some bedside monitors cannot set the upper limits.

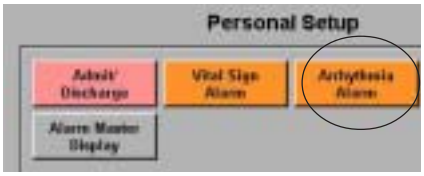
Setting the Arrhythmia Alarm

Set the following settings for the arrhythmia alarm.

- Alarm detection condition
- Alarm ON/OFF
- Creating the arrhythmia recall files ON/OFF
- Arrhythmia recording ON/OFF

1. Touch the basic information area of the bed you are going to set alarms for.

2. Touch “Menu” to display the Menu screen.



3. Touch “Arrhythmia Alarm” to display the Arrhythmia Alarm window.

4. Set the necessary settings.

Set the settings for each arrhythmia.
Every touching toggles ON and OFF.
Alarm: Alarm availability
Recall: Arrhythmia recall file creation
Record: Arrhythmia recording

When turning an alarm of crisis level to OFF, a confirming message window appears.

Alarm detection condition

Current value

Increase/Decrease key: Touch to increase or decrease the value.

Alarm detection condition: Touch to display the setting box for the alarm detection condition.

Items not available with the bedside monitor

5. Touch “All Beds” to return to the All Beds screen.

Initialization of Arrhythmia Recording

The arrhythmia recording is initialized to the setting on “Alarm Master 1” when you set up the monitored bed.

Alarm Limits Range

Item	Detection condition		
	Setting range	Step	Unit
ASYSTOLE	3 to 10	1	s
V.FIB	---		
VF/VT	---		
EXT. TACHY	150 to 300 (TACHYCARDIA+30)		beats/min
EXT. BRADY	5 to 60 (BRADYCARDIA–30)		beats/min
V. TACHY	---		
TACHYCARDIA	OFF, 20 to 300	5	beats/min
BRADYCARDIA	OFF, 15 to 295	5	beats/min
VPC RUN	OFF, 3 to 8	1	beats
COUPLET	OFF, ---		
EARLY VPC			
MULTIFORM			
BIGEMINY			
FREQ. VPC	OFF, 1 to 50	1	beats/min
PROLONGED RR	OFF, ---		
VPC			

EXT TACHY and EXT BRADY cannot be set by themselves. They change according to the TACHY and BRADY settings.

Setting the ST Alarm

NOTE

The ST alarm does not occur for beds connected to the network via the QI-910R interface.

1. Touch the basic information area of the bed you are going to set alarms for.

2. Touch “Menu” to display the Menu screen.

3. Touch “ST Alarm” to display the ST Alarm window.

4. Set the necessary settings.

Turning the ST alarm recording on or off.

Current value:
Currently measured value is displayed.

Currently set upper/lower limit

Lead selection key:
Touch to change the lead. Leads displayed here depend on the bed’s measurement environment.

AUTO:
Touch to automatically set the upper/lower limit of the lead (Auto Alarm Setting)

Upper limit:
Current value is displayed.
Touch this button to set the upper limit.

Increase/Decrease key:
Touch to increase or decrease the value of the upper or lower limit.

Lower limit:
Current value is displayed.
Touch this button to set the lower limit.

AUTO:
Touch to automatically set the upper/lower limit of all the measurable leads for the bed.

Current measurement value

Current upper/lower limits are displayed in the bar.
Touch the bar to set the value of the upper or lower limit.

5. Touch “All Beds” to return to the All Beds screen.

Alarm Limits Range

Item		Setting range		Step	Unit
		Lower limit	Upper limit		
ST	I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6, MCL, ECG1, ECG2	–2.00 - +1.99	–1.99 - +2.00	0.01	mV

Setting ST Alarms with Auto Alarm Setting Functions

You can set upper and lower limits with the Auto Alarm Setting function. In the Auto Alarm Setting function, the upper and lower limits are automatically calculated based on the patient's current ST values. The baseline value for the upper and lower limit calculation is based on the parameter value at the moment the Auto Alarm is set.

To set ST alarm upper/lower limits of all the measurable leads for the bed by Auto Alarm Setting, touch "AUTO".

Following are the calculation formulas.

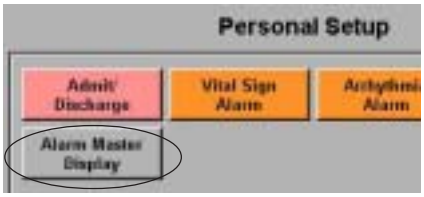
Item		Lower limit	Upper limit	Unit
ST	I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6, MCL, ECG1, ECG2	ST – 0.5	ST + 0.5	mV

Setting All Alarms to a Preset Pattern (Alarm Master)

For fast and easy alarm setup, a group of alarm items can be set all together to one group of preset settings. This is called an alarm master. This is useful, for example, if there are typical alarm settings at your hospital, or you have certain alarm settings for certain patients. You can change individual alarm settings after setting all alarms with an alarm master. You can set three alarm masters and save them in the central monitor.

1. Touch the basic information area of the bed you are going to set alarms for.

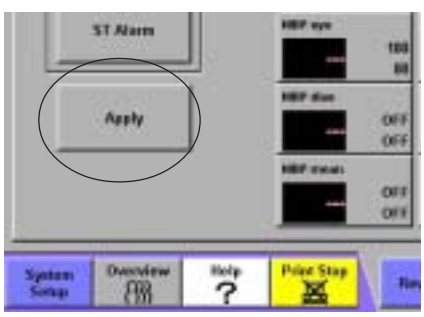
2. Touch “Menu” to display the Menu screen.



3. Touch “Alarm Master Display” to display the Alarm Master window.

4. Touch “Alarm Master 1”, “Alarm Master 2” or “Alarm Master 3” to select the alarm master you want to apply.

5. Touch “Vital Sign Alarm”, “Arrhythmia Alarm” or “ST Alarm” to select which alarm settings in the alarm master you want to display.



6. Confirm that the selected alarm settings of the selected alarm master are displayed on the screen. Touch “Apply”. The confirmation message window appears.

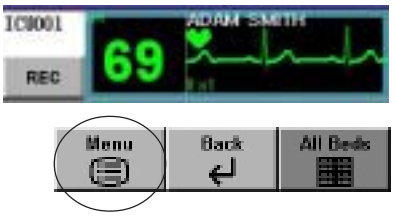
7. Touch ”Yes”. The alarm master settings displayed on the screen are applied as the alarm settings.

8. Change individual alarm settings on each alarm window if necessary.

9. Touch “All Beds” to return to the All Beds screen.

Turning Signal Loss Alarm On/Off

Set the Signal Loss Alarm On or Off for the beds via the ORG-9200/9700 multiple patient receiver. When this is set to ON, there are continuous “bing bong” sounds when signal loss occurs.



1. Touch the basic information area of the bed you are going to set alarms for.

2. Touch ”Menu” to display the Menu screen.

3. On the Menu screen, touch “Other Settings” to display the Other Settings window.

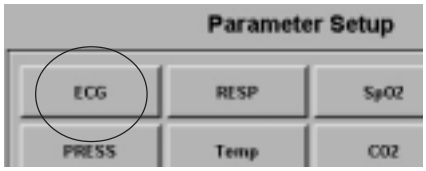
4. Touch “ON” or “OFF”.

Setting the Lead Off Alarm

Set the Lead Off Alarm for the beds via the ORG-9200/9700 multiple patient receiver.

1. Touch the basic information area of the bed you are going to set alarms for.

2. Touch ”Menu” to display the Menu screen.



3. On the Menu screen, touch “ECG” to display the ECG window.

4. Touch “Other Settings”. The Other Settings window opens.

5. Touch either “Once”, “Cont” or “OFF” at the Lead Off Alarm.

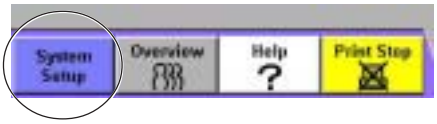
Setting an Alarm Master

You can set each individual value of each alarm master. For more details about alarm masters, refer to the “Setting All Alarms to a Preset Pattern (Alarm Master)”.

Three alarm masters each (Alarm Master 1, Alarm Master 2, Alarm Master 3) are provided for vital alarm, arrhythmia alarm and ST alarm.

Setting an Alarm Master

You can set alarm master settings on the Alarm Master window on the System Setup. Regardless of the measurement environment of the monitored beds, you can set values for every parameter which can be displayed on the central monitor.

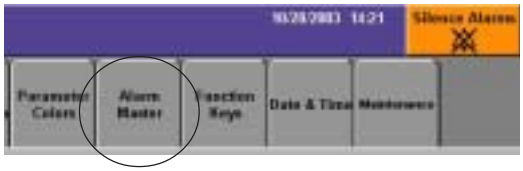


1. Touch “System Setup” to display the System Setup.

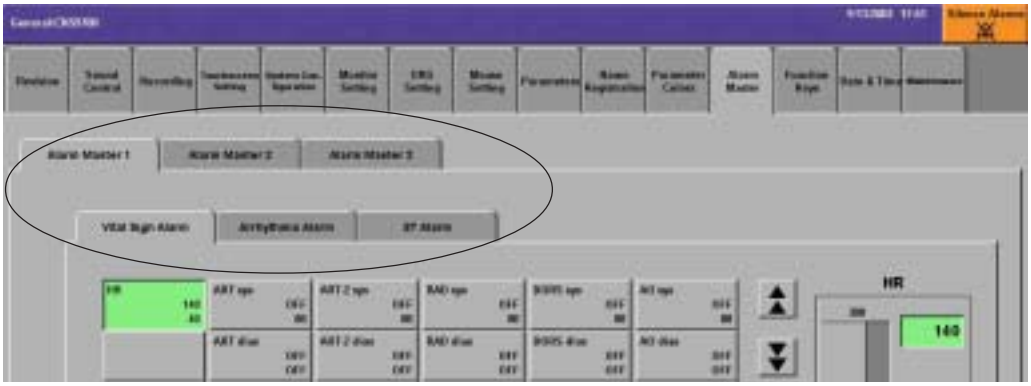
2. Enter the password.

The password is displayed as ****.

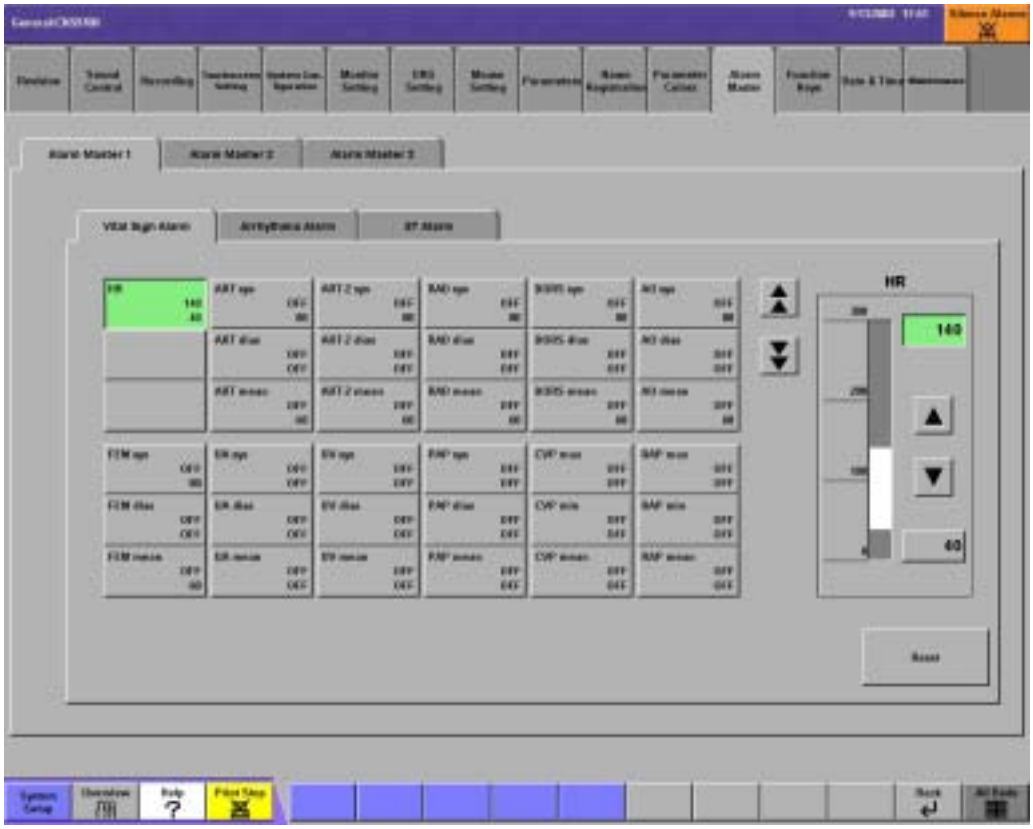
3. Touch “Alarm Master” to display the Alarm Master window.



4. Touch “Alarm Master 1”, “Alarm Master 2” or “Alarm Master 3”, then touch “Vital Sign Alarm”, “Arrhythmia Alarm” or “ST Alarm”.



5. Set the values.



6. Touch “All Beds” to return to the All Beds screen.

Factory Default Settings of Each Alarm Master

Vital Alarm Master

The Vital alarm masters have three kinds of setting windows: vital sign, blood pressure, temperature.

The factory default settings of Alarm Master 3 are for infant.

Alarm Item		Lower Limit	Upper Limit	Unit
ECG	HR	Master1/2: 40 Master 3: 80	Master1/2: 140 Master 3: 180	beat/min
Pulse rate		Off	Off	count/min
Resp	Resp rate	Off	Off	count/min
	APNEA	—	Master1/2: 20 Master3: 20	s
NIBP	systole	Master1/2: 80 Master 3: 50	Master1/2: 180 Master 3: 100	mmHg
		Master1/2: 13.5 Master 3: 5.5	Master1/2: 24.0 Master 3: 13.5	kPa
	diastole	Off	Off	mmHg
		Off	Off	kPa
	mean	Off	Off	mmHg
		Off	Off	kPa
CNIBP	systole	Master1/2: 80 Master 3: 30	Master1/2: 180 Master 3: 100	mmHg
		Master1/2: 13.5 Master 3: 5.5	Master1/2: 24.0 Master 3: 13.5	kPa
	diastole	Off	Off	mmHg
		Off	Off	kPa
	mean	Off	Off	mmHg
		Off	Off	kPa
SpO_2	SpO_2, SpO_2-2	90	Off	%
	delta SpO_2	Off	Off	
Temp	Tskin, Tskin-2 to 3, Tcore, Trect, Teso, Ttymp, Tblad, Taxil, Tnaso, Temp, Temp-2 to 8	Off	Master1/2: 38.0 Master 3: 39.0	°C
		Off	Master1/2: 100.0 Master 3: 102.0	°F
delta T	delta T, delta T-2 to 4	Off	Off	°C
		Off	Off	°F
Tb, Tb (CCO)		Off	Master1/2: 38.0 Master 3: 39.0	°C
		Off	Master1/2: 100.4 Master 3: 102.0	°F
O_2	FiO_2	18	Off	%
	EtO_2	Off	Off	

Alarm Item		Lower Limit	Upper Limit	Unit
CO_2	$FiCO_2$	—	Master 1/3: Off Master 2: 3	mmHg
			Master 1/3: Off Master 2: 0.3	kPa
	$EtCO_2$	Off	Off	mmHg
		Off	Off	kPa
N_2O	FiN_2O	Off	80	%
	EtN_2O	Off	Off	
HAL	FiHAL	Off	4.0	%
	EtHAL	Off	Off	
ISO	FiISO	Off	5.0	%
	EtISO	Off	Off	
ENF	FiENF	Off	5.0	%
	EtENF	Off	Off	
SEV	FiSEV	Off	6.0	%
	EtSEV	Off	Off	
DES	FiDES	Off	12.0	%
	EtDES	Off	Off	
$S\bar{v}O_2$		Off	Off	%
CCO		Off	Off	L/min
MV		Master 1/2: 4.0 Master 3: Off	Master 1/2: 10.0 Master 3: Off	L/min
Ppeak		Off	Master 1/2: 26 Master 3: Off	cmH_2O
PEEP		Off	Master 1/2: 10 Master 3: Off	
tcPO2		Off	Off	mmHg kPa
tcPCO2		Off	Off	mmHg kPa
BIS		40	Off	%
EEG	SEF1/SEF2	Off	Off	Hz
	TP1/TP2	Off	Off	nW

Alarm Item			Lower limit		Upper limit	
			mmHg	kPa	mmHg	kPa
IBP	AO, ART, ART-2, RAD, FEM	Systole	Master 1/2: 80 Master 3: 50	Master 1/2: 10.5 Master 3: 6.5	Off	Off
		diastole	Off	Off		
		mean	Master 1/2: 60 Master 3: 30	Master 1/2: 8.0 Master 3: 4.0		
	CVP, RAP	Mean/Sys/Dias	Off	Off		
	PAP	systole	Off	Off		
		diastole				
		mean				
	RVP	systole				
		diastole				
		mean				
	LAP	mean				
	LVP	systole				
		diastole				
		mean				
	UA	systole				
		diastole				
		mean				
	UV	systole				
		diastole				
		mean				
	ICP, ICP-2 to 4	mean				
	PRESS, PRESS-2 to 8	systole				
		diastole				
		mean				
	DORS	systole	Master 1/2: 80 Master 3: Off	Master 1/2: 10.5 Master 3: Off	Off	Off
		diastole	Off	Off	Off	Off
		mean	Master 1/2: 60 Master 3: Off	Master 1/2: 8.0 Master 3: Off	Off	Off

ST Alarm Master

The factory default settings are the same as those on the ST Alarm window.

Alarm Item	Lower Limit	Upper Limit	Unit
ST	Off	Off	mV

Arrhythmia Alarm Master

The factory default settings of Alarm Master 3 are for infant.

Alarm Item	On/Off	Threshold	Recall File	Record	Unit
ASYSTOLE	ON	Master 1/2: 5 Master 3: 3	ON	ON	s
V FIB	ON	---	Master 1/2: ON Master 3: OFF	Master 1/2: ON Master 3: OFF	---
EXT TACHY		Master 1/2: 170 Master 3: 210	Master 1/2: ON Master 3: OFF	Master 1/2: ON Master 3: OFF	beat/min
EXT BRADY		Master 1/2: 10 Master 3: 50	Master 1/2: ON Master 3: OFF	Master 1/2: ON Master 3: OFF	
V TACHY		---	Master 1/2: ON Master 3: OFF	Master 1/2: ON Master 3: OFF	---
TACHYCARDIA		Master 1/2: 140 Master 3: 180	OFF	OFF	beat/min
BRADYCARDIA		Master 1/2: 40 Master 3: 80	OFF	OFF	
VPC RUN	Master 1: ON Master 2/3: OFF	3	Master 1: ON Master 2/3: OFF	Master 1: ON Master 2/3: OFF	beats
COUPLET	OFF	---	OFF	OFF	---
EARLY VPC			OFF	OFF	
MULTIFORM			OFF	OFF	
BIGEMINY			OFF	OFF	
FREQ VPC		10	---	OFF	count/min
PROLONGED RR		---	OFF	OFF	---
VPC	---	---	OFF	OFF	---

Adjusting the Alarm Sound Volume

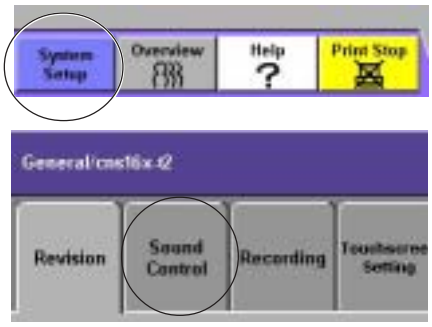
WARNING

Do not adjust the sound volume at the display unit. If you decrease the volume to the minimum, there is no alarm sound.

Adjust the alarm sound volume at the Sound Control window on the System Setup. There are seven volume levels.

NOTE

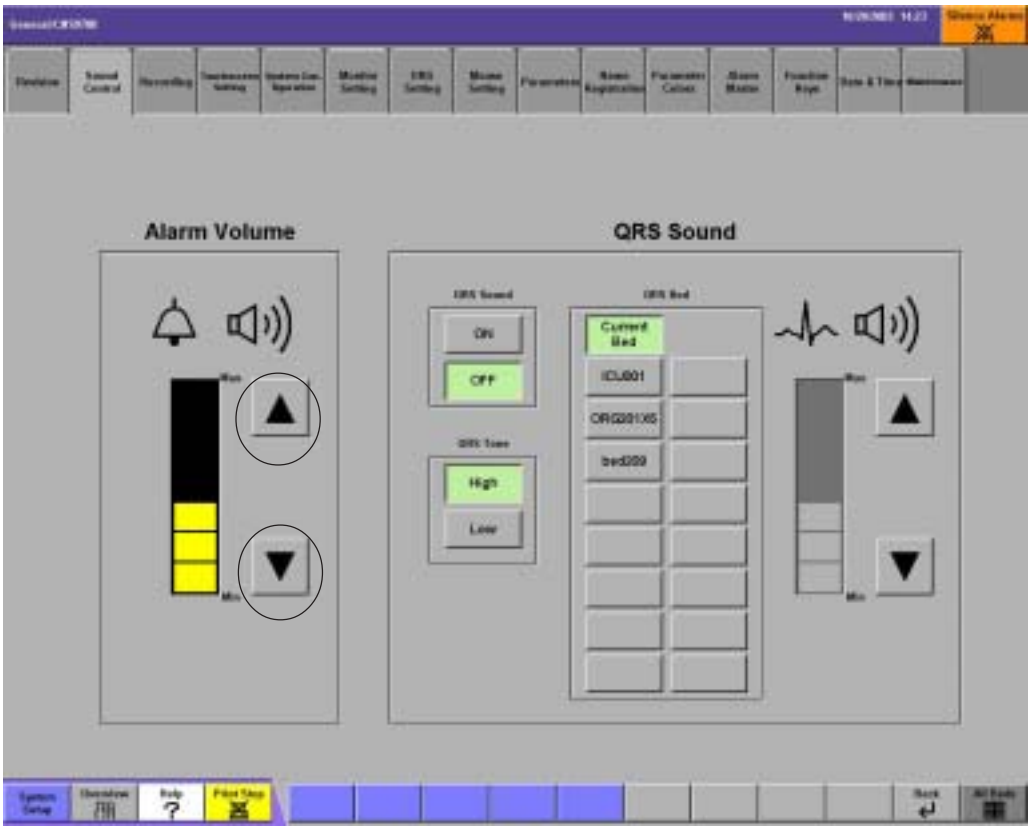
An alarm still sounds when the volume is set to the lowest level.



1. Touch “System Setup” to display the System Setup.

2. Touch ”Sound Control” to display the Sound Control window.

3. Touch “▲” or “▼” to adjust the volume. Every time you change the volume, there is a sound at the selected volume. You can also change the volume by directly touching the bar.



4. Touch “All Beds” to return to the All Beds screen.

Section 7 All Beds Screen

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- Displaying the All Beds Screen 7.1
- Screen Description 7.2
  - 16 beds (One waveform) 7.2
  - 12 beds (Two waveforms) 7.3
  - 8 beds (Two waveforms) 7.3
  - 6 beds (Two waveforms) 7.4
  - 4 beds (Two waveforms) 7.4
- Freezing Waveforms 7.5
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Changing the All Beds Screen Display Setting 7.6
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  - Setting the Sensitivity and Scale of the Displayed Waveform 7.6
  - Selecting the Parameter of the Displayed Waveform 7.7
  - Selecting the Parameter of the Displayed Measurement Data 7.8
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Overview

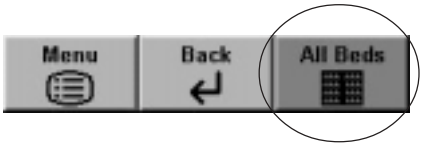
On the All Beds screen, you can view waveforms and numeric data of all monitored beds at the same time.

NOTE

Sometimes numeric data and messages disappear for a moment. This is normal and occurs when the display is refreshed.

Displaying the All Beds Screen

The All Beds screen is the basic screen for all the other screens. All the other screens have an “All Beds” key at the bottom right. Touch “All Beds” to display the All Beds screen.



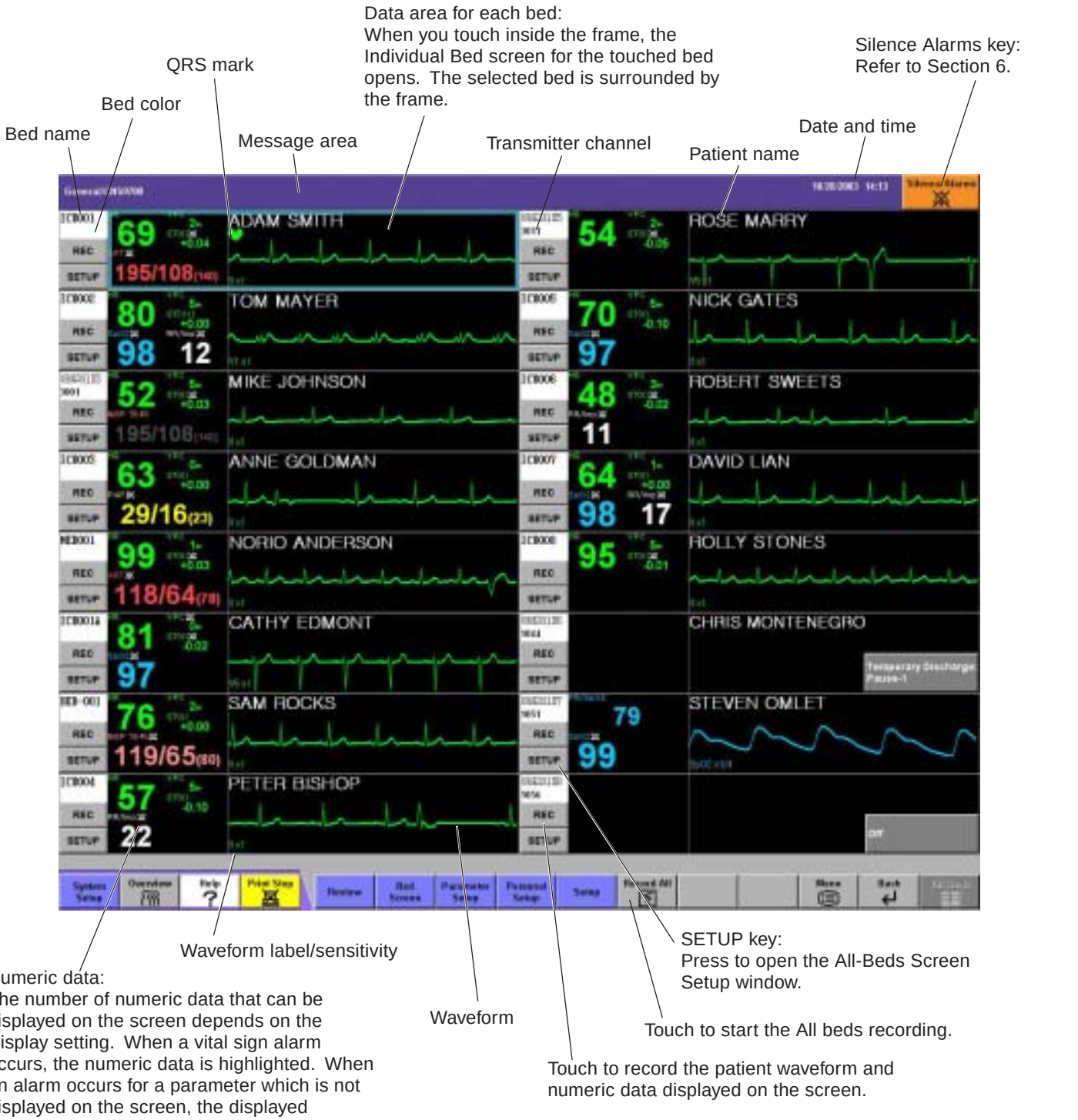
NOTE

When a screen other than the All Beds screen is displayed and there is no key operation for a certain period, the screen automatically returns to the All Beds screen. You can set the period at “Screen Timeout” on the System Configuration window of the System Setup. The factory default setting is set to 5 minutes.

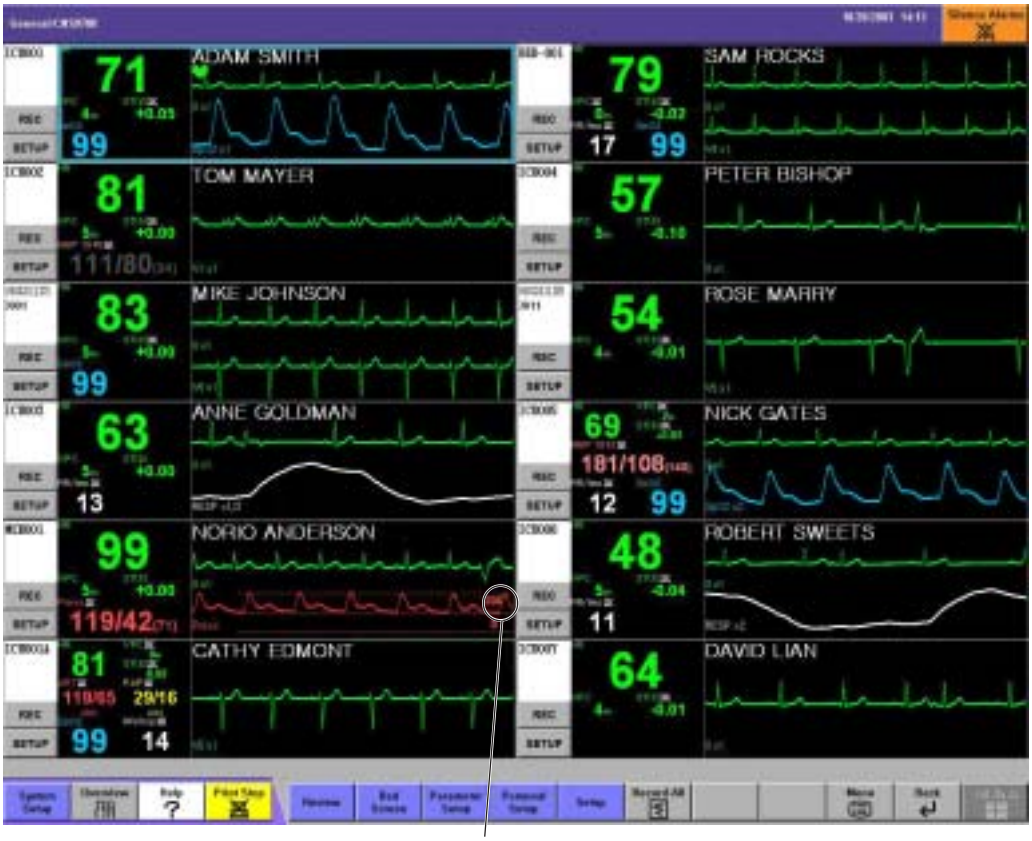
Screen Description

You can choose the number of beds to be displayed from 16 beds (one waveform per bed), 12 beds (two waveforms per bed), 8 beds (two waveforms per bed), 6 beds (two waveforms per bed) and 4 beds (two waveforms per bed). You need the QP-971P 12 patient expansion program kit and the QP-972P 16 patient expansion program kit to display 16 beds, and the QP-971P 12 patient expansion program kit to display 12 beds. For each bed, you can select the parameter of the displayed waveform and its sensitivity and scale, the numeric data to be displayed and the bed color.

16 beds (One waveform)


Data area for each bed:
When you touch inside the frame, the Individual Bed screen for the touched bed opens. The selected bed is surrounded by the frame.
Silence Alarms key:
Refer to Section 6.
QRS mark
Bed color
Bed name
Message area
Transmitter channel
Patient name
Date and time
ADAM SMITH
ROSE MARRY
TOM MAYER
NICK GATES
MIKE JOHNSON
ROBERT SWEETS
ANNE GOLDMAN
DAVID LIAN
NORIO ANDERSON
HOLLY STONES
CATHY EDMONT
CHRIS MONTENEGRO
SAM ROCKS
STEVEN OMLET
PETER BISHOP
Waveform label/sensitivity
SETUP key:
Press to open the All-Beds Screen Setup window.
Numeric data:
The number of numeric data that can be displayed on the screen depends on the Display setting. When a vital sign alarm occurs, the numeric data is highlighted. When an alarm occurs for a parameter which is not displayed on the screen, the displayed parmeter changes to the alarmed parameter and highlighted.
Waveform
Touch to start the All beds recording.
Touch to record the patient waveform and numeric data displayed on the screen.

12 beds (Two waveforms)



8 beds (Two waveforms)

6 beds (Two waveforms)

4 beds (Two waveforms)

Freezing Waveforms

NOTE

- **You need to assign the waveform freezing function to a function key in advance.**
- **Numeric data are not frozen. Numeric data are always updated.**

Touch “Freeze” to freeze all waveforms of all beds. The clock time when the freezing started is displayed below the date on the top of the screen.

During freezing, “Freeze” changes to “Unfreeze”.

To unfreeze, touch “Unfreeze” or change to another screen.

Temporarily Silencing/ Suspending Alarms

Refer to Section 6.

Changing the All Beds Screen Display Setting

Set the following settings for the All Beds screen display.
For each bed:

- Set sensitivity and scale of the displayed waveforms
- Select the parameter of the displayed waveforms
- Select the parameter of the displayed numeric data
- Select the bed color

Monitor Setting window of the System Setup:

- Monitored Beds Setting
- Display Setting

System Configuration window of the System Setup:

- Select the size of patient name (large/normal)

Setting Individually for Each Bed

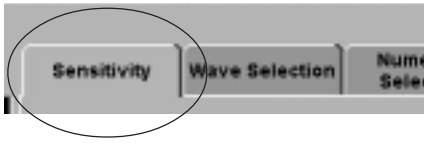
Following settings are set individually for each bed.

- Set sensitivity and scale of the displayed waveform
- Select the parameter of the displayed waveform
- Select the parameter of the displayed numeric data
- Select the bed color

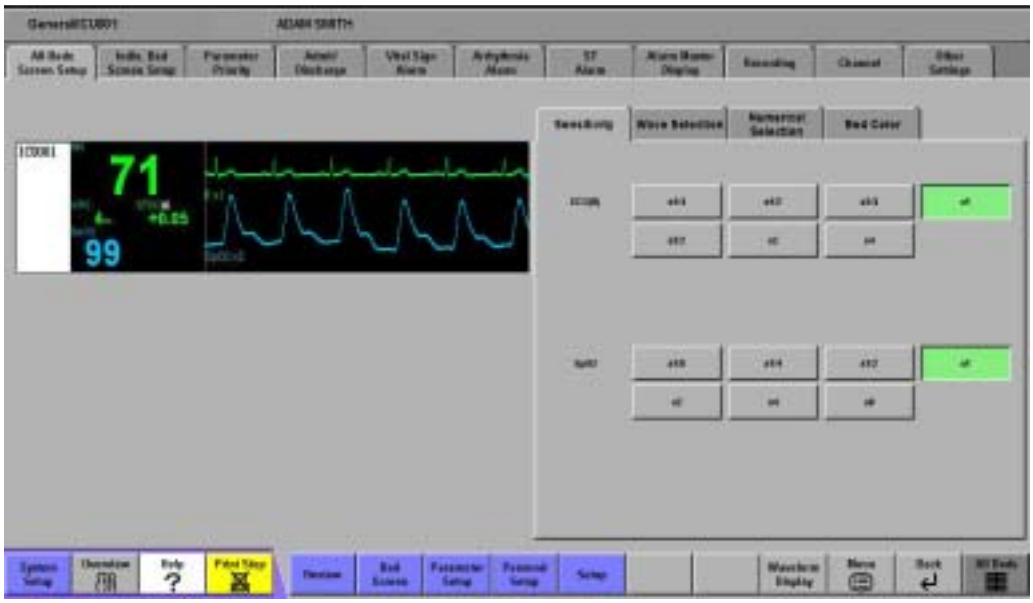
Setting the Sensitivity and Scale of the Displayed Waveform

This setting coincides with the setting on the Indiv. Bed Screen Setup of the Individual Bed screen.

1. On the All Beds screen, touch “SETUP” of the bed you want to change settings for. The setting window for the bed is displayed.



2. Touch “Sensitivity”.



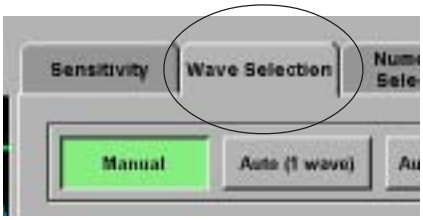
3. Set the sensitivity and scale for each displayed waveform. The left window shows the result on the All Beds screen.

Selecting the Parameter of the Displayed Waveform

Select the parameter of the waveform to be displayed on the All Beds screen.

- Auto: The parameter of the automatically selected waveform displayed on the All Beds screen. Automatic selection is based on the parameter priority and changes according to the situation.
- Manual: The parameter of the manually selected waveform is displayed on the All Beds screen.

1. On the All Beds screen, touch “SETUP” of the bed you want to change settings for. The setting window for the bed is displayed.



2. Touch “Wave Selection”.

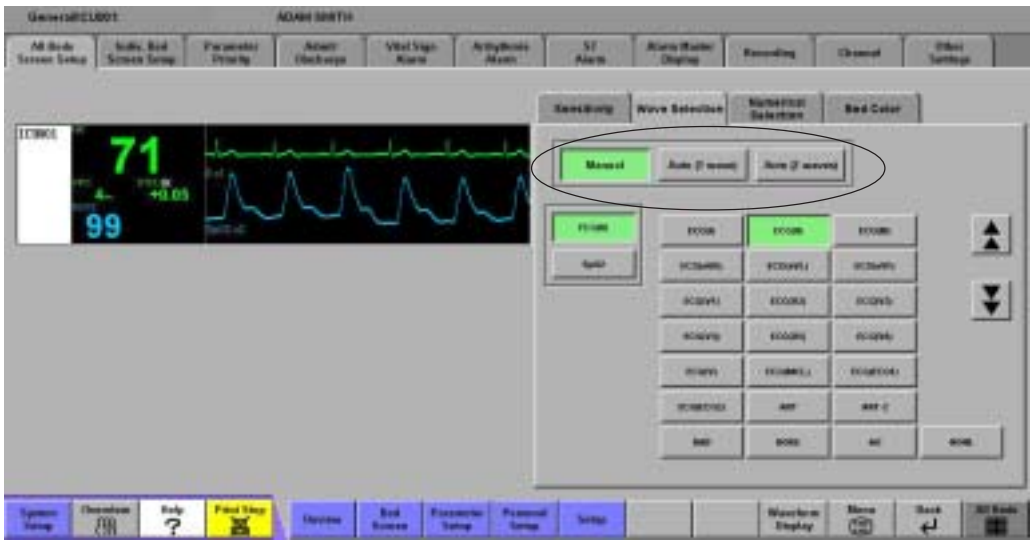
3. Select whether the parameter of the waveform is to be set automatically or manually.

- Auto: The displayed parameter(s) are automatically selected from the currently measured parameters according to the parameter priority. Select the number of waveforms to be displayed on the All Beds screen. The number of automatically set parameters depends on the number of displayed beds.
  - 4/6/8/12 beds: maximum two waveforms
  - 16 beds: one waveform

NOTE

If the number of measured parameters is less than the selected maximum number of parameters, the number of displayed parameters decreases automatically.

- Manual: Select the parameter(s) of each waveform.
  Touch the key of the parameter to display its waveform. You can choose the parameter(s) to be displayed on the All Beds screen from the currently measured parameter(s) or the parameter(s) selected on the Parameter window of the System Setup screen. On the left window, you can confirm the display on the All Beds screen.



Selecting the Parameters of the Displayed Measurement Data

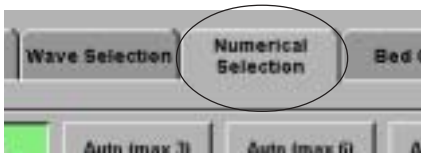
Selecting the parameters of the measurement data to be displayed on the All Beds screen.

- Auto: The automatically selected parameter of the measurement data displayed on the All Beds screen. Automatic selection is based on the parameter priority and changes according to the situation.
- Manual: The manually selected parameter of the measurement data is displayed on the All Beds screen.

The first parameter is displayed in large size and the other parameters are displayed in the remaining area in equal size.
However, when you select the S/D/M display format of blood pressure measurement values (Refer to Section 12), it is displayed as large as possible.

When you select HR as the first display parameter, VPC and ST also appear.

1. On the All Beds screen, touch “SETUP” of the bed you want to change settings for. The setting window for the bed is displayed.



2. Touch “Numerical Selection”.

3. Set whether the parameter of the waveform is to be selected manually or automatically.

- Auto: The displayed parameter(s) are automatically selected from the currently measured parameters according to the parameter priority. Select 3, 6, or 8 for the maximum number of parameters to be displayed.

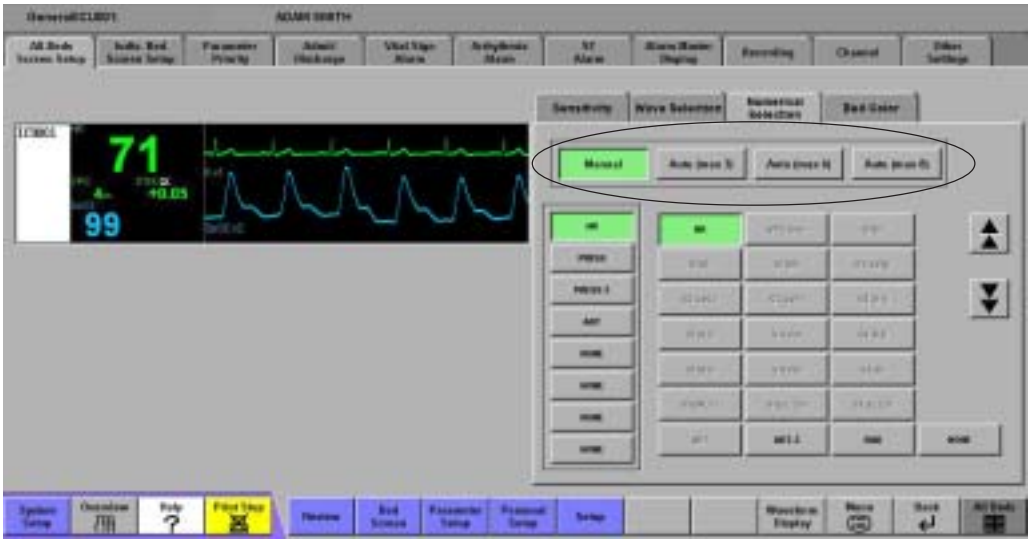
NOTE

If the number of measured parameters is less than the selected maximum number of parameters, the number of displayed parameters decreases automatically. The measurement value may not follow the parameter priority when displaying S/D/M format blood pressure measurement values.

- Manual: Set the parameter display order.
  Touch the key of the parameter to display the waveform. You can choose the parameter(s) to be displayed on the All Beds screen from the currently measured parameter(s) or from the parameter(s) selected on the Parameters window of the System Setup screen. On the left window, you can confirm the display on the All Beds screen.

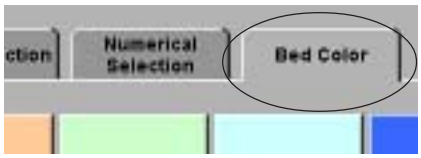
NOTE

Whey you select the S/D/M display format of the blood pressure measurement values, the blood pressure measurement value is displayed widely. Therefore, some selected parameters may not be displayed.



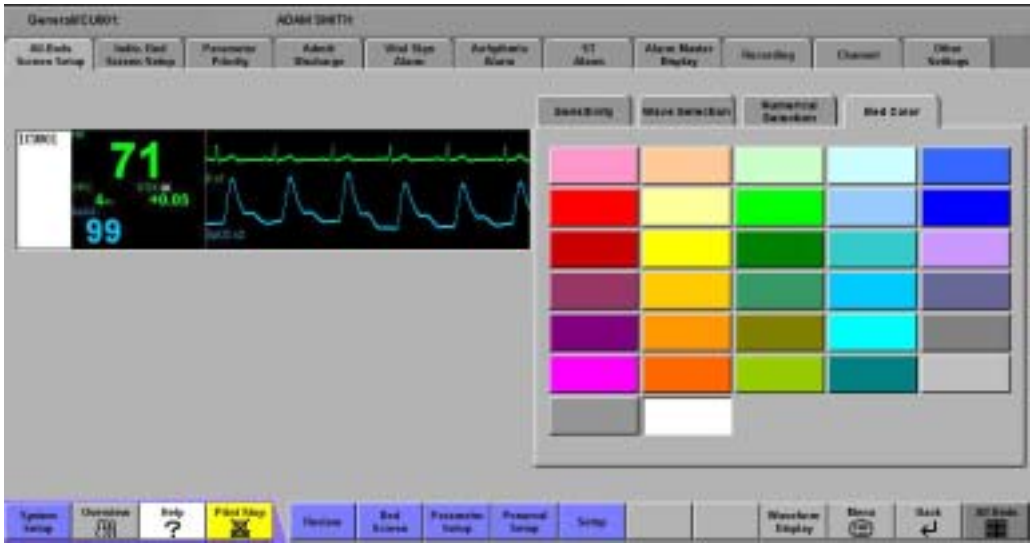
Setting the Bed Color

You can choose the background color of the bed name and telemetry channel on the All Beds screen and basic information area.



1. On the All Beds screen, touch “SETUP” of the bed you want to change settings for. The setting window for the bed is displayed.

2. Touch “Bed Color” and select the color.



Setting for All Beds on the System Configuration Window of the System Setup

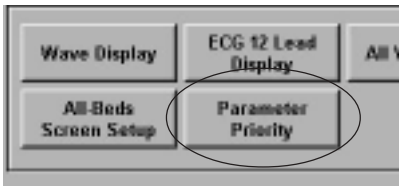
You can select the size of the patient’s name display on the All Beds screen. Refer to Section 4.

Setting for All Beds on the Monitor Setting Window of the System Setup

The Monitor Setting window of the System Setup has settings that affect all beds. Refer to Section 4.

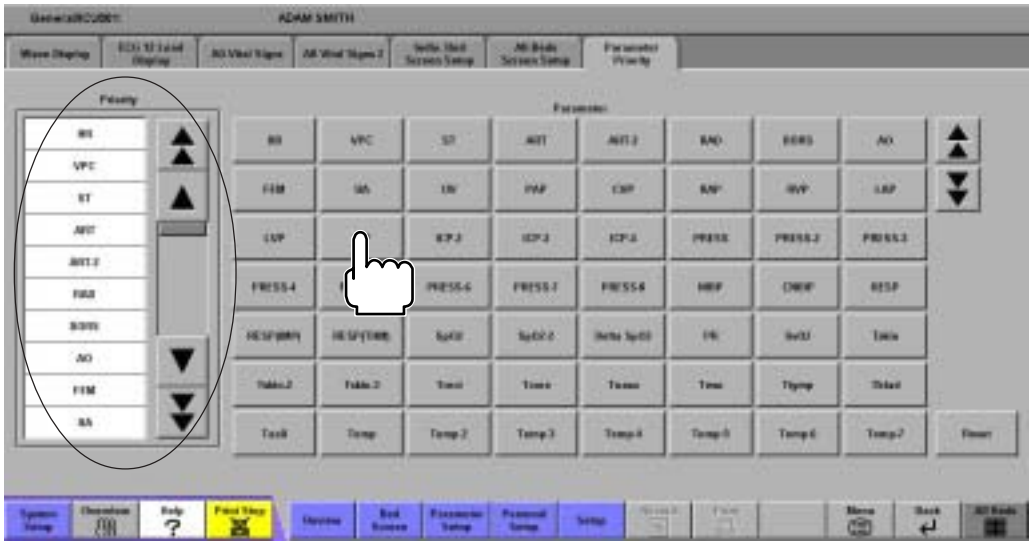
Setting Parameter Priority

Parameters are displayed on All Beds screen according to priority. Refer to Section 15 for the factory default settings of parameter priority.



1. On the All Beds screen, touch the basic information area of the bed you want to change settings for.
2. Touch “Menu” to display the Menu screen.
3. Touch “Parameter Priority” to display the Parameter Priority window.
4. Touch a key on the left in “Priority” to select the position you want to insert the parameter and touch the key on the right to select a parameter.

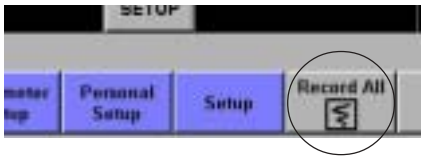
When you lowering the priority of the parameter, it is inserted below the selected position. When raising the priority of the parameter, it is inserted above the selected parameter.



5. Touch “All Beds” to return to the All Beds screen.

Recordings on the All Beds Screen

All Beds Recording



You can record 10 second delayed waveforms and numeric data of all the monitored beds with the WS-971R recorder unit.

Set “Recording Sweep Speed” at “Other”on the Recording window of the Setup or the Recording window of the System Setup.

To cancel recording, touch “REC Stop”.

Necessary Settings for All Beds Recording

Set “Recording Sweep Speed” at “Other” on the Recording window of the Setup. Refer to Section 10 for detail.

Other Recordings

On the All Beds screen, you can do the following recordings with the WS-971R recorder unit.

Manual Recording: Delayed recording
Automatic recording: Periodic recording, Alarm recording
Call recording
Remote delayed recording

Section 8 Individual Bed Screen

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- Displaying the Individual Bed Screen 8.1
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- Changing Display Types 8.4
- Changing the Beds 8.4
- Freezing Waveforms 8.4
- Temporarily Silencing/Suspending Alarms 8.4
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  - Selecting the Waveform Sensitivity and Scale on the Wave Display Window 8.6
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Overview

The Individual Bed screen displays waveforms and numerical data of one bed selected from the monitored beds. The Individual Bed screen has the following three types of data display windows and the Indiv. Bed Screen Setup window.

- Wave Display window
  Displays all currently measured waveforms and selected numeric data.
- ECG 12 Lead Display window
  Displays 12 lead ECG and ST level of each lead.
- All Vital Signs / All Vital Signs 2 window
  Displays all numerical data.

NOTE

Sometimes numeric data and messages disappear for a moment. This is normal and occurs when the display is refreshed.

Displaying the Individual Bed Screen

From the All Beds screen

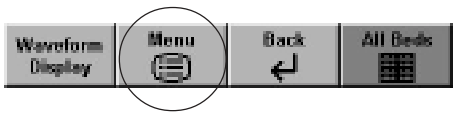
Touch the data area of the bed you want to display.

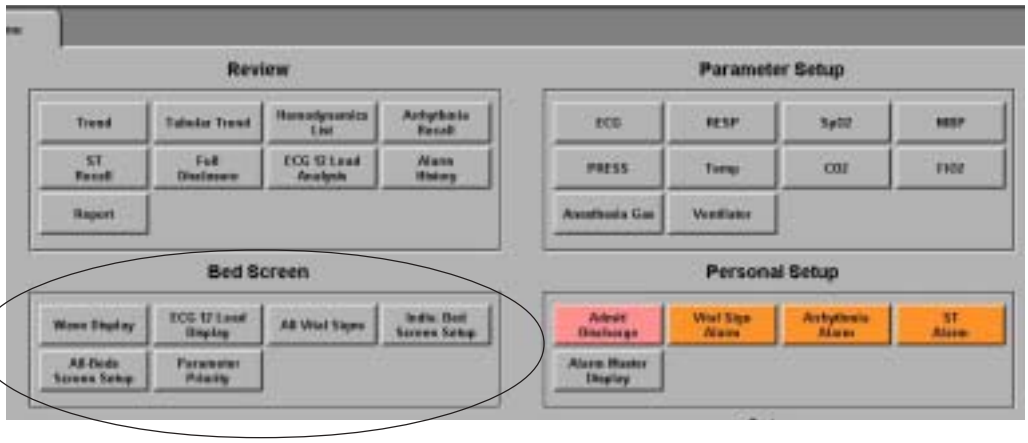
From any screen other than the All Beds screen

Touch “Waveform Display”. The Wave Display window opens.

From the Menu screen

Touch “Menu” to display the Menu screen and then touch the key for a desired type of the Individual Bed screen.





Screen Description

The Individual Bed screen displays waveforms and numerical data of one bed selected from the monitored beds. Up to 8 waveforms can be displayed for the patient. At the top of the screen, there is the basic information area where one or two waveform and numeric data are displayed for all monitored beds.

The Individual Beds screen has three display types.

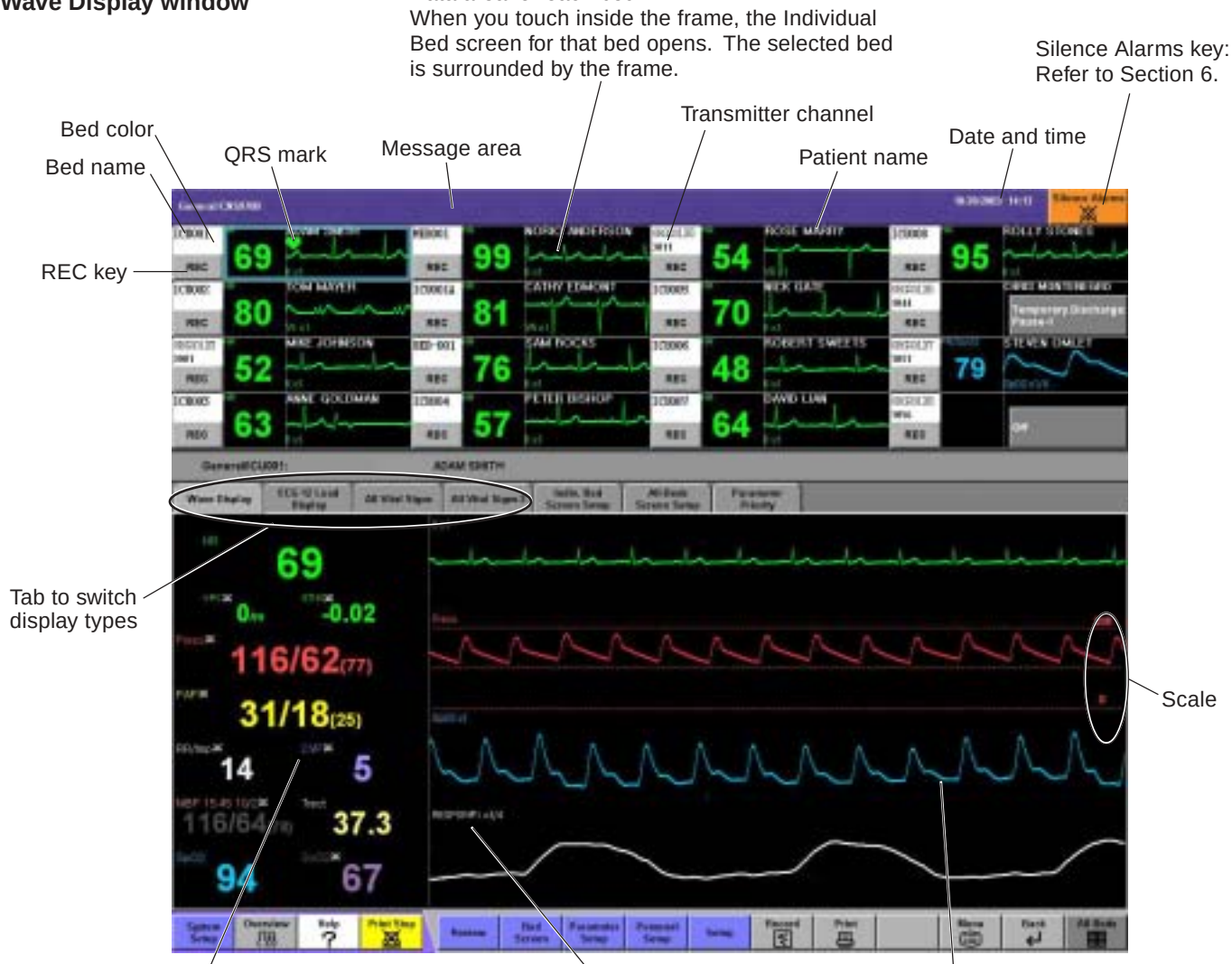
- Wave Display window
- ECG 12 Lead Display window
- All Vital Signs / All Vital Signs 2 window

On the Expand Individual Bed screen:

- The number of parameters of the displayed waveforms and measurement data are different from the regular screen.
- There is no basic information area. The waveforms and measurement data of all patients are displayed on the All Beds screen.

Refer to Section 1 “Expand Individual Bed Screen” for specific functions.

Wave Display window


Data area for each bed:
When you touch inside the frame, the Individual Bed screen for that bed opens. The selected bed is surrounded by the frame.
Silence Alarms key:
Refer to Section 6.
Transmitter channel
Bed color
Bed name
QRS mark
Message area
Patient name
Date and time
REC key
Tab to switch display types
Scale
Numeric data (maximum 11):
Touch to switch the screen to the setting window for each parameter. When a vital sign alarm occurs, the numeric data is highlighted. When an alarm occurs for a parameter which is not displayed on the screen, the displayed parameter changes to the alarmed parameter and highlighted.
Waveform label/sensitivity
Waveform:
Touch to open the sensitivity/ scale window

ECG 12 Lead Display Window

Numeric data (maximum 11):
Touch to switch the screen to the setting window for each parameter. When a vital sign alarm occurs, the numeric data is highlighted. When an alarm occurs for a parameter which is not displayed on the screen, the displayed parameter changes to the alarmed parameter and highlighted.

All Vital Signs Window

All Vital Signs 2 window displays numeric data that cannot be displayed on the All Vital Signs window. When this tab is touched, the right side numeric display shows other numeric data while the left side numeric display does not change.

Numeric data (maximum 11):
Touch to switch the screen to the setting window for each parameter. When a vital sign alarm occurs, the numeric data is highlighted.

All vital signs numeric data:
With the All Vital Sign window, maximum 56 data
With the All Vital Sign window and All Vital Sign 2 window, maximum 112 data.
When a vital sign alarm occurs, the alarmed data is highlighted.

Changing Display Types

Touch the tab of the display type you want to display.

Changing the Beds

Touch the basic information area of the bed you want to display on the top of the screen.

Freezing Waveforms

NOTE

- **You need to assign the waveform freezing function to a function key in advance. Refer to section 4.**
- **Numeric data are not frozen. Numeric data are always updated.**

Touch “Freeze” to freeze all waveforms of individual bed screen. The clock time when the freezing started is displayed below the date on the top of the screen.

During freezing, “Freeze” changes to “Unfreeze”.

To unfreeze, touch “Unfreeze” or change to another screen.

Temporarily Silencing/ Suspending Alarms

Refer to Section 6.

Learning ECG

CAUTION

If there is any doubt about the arrhythmia analysis, make the central monitor relearn the patient's VPC. Otherwise, an important arrhythmia may be overlooked.

NOTE

- **To relearn ECG, you need to assign the learning ECG function to a function key in advance. Refer to section 4.**
- **When you touch "Learning ECG"at the central monitor, the bedside monitor relearns ECG.**
- **Some bedside monitors automatically relearn ECG whenever the pattern of normal ECG changes.**

If there is any question about the arrhythmia analysis result, relearn the dominant ECG. While learning, the "LEARNING" message appears on the screen.

Touch "Learning ECG" to start ECG learning.

Changing the Individual Bed Screen Display Settings

Set the following settings for the Individual Bed screen display.

On the Indiv. Bed Screen Setup window

- Selecting the waveform sensitivity and scale on the Wave Display window
- Selecting the Measurement Data Displayed on the Wave Display Window, ECG 12 lead display window and All Vital Signs window
- Changing the Sweep Speed
- Changing the Sweep Speed of the Respiration Waveform
- Changing the Blood Pressure Scale

On data display windows of the Individual Bed screen

- Selecting the waveform sensitivity and scale on the Wave Display window
- Setting vital sign alarms and measurement conditions for the parameters displayed on the Individual Bed screen.

Setting on the Indiv. Bed Screen Setup Window

Selecting the Waveform Sensitivity and Scale on the Wave Display Window

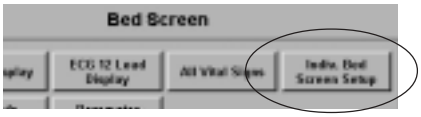
NOTE

The waveform sensitivity and scale setting on the Individual Bed Screen Setup window links to the setting on Wave Display windows of the Individual Bed screen and All Bed screen display.

1. Display the Individual Bed Screen Setup window.

1) Touch the basic information area of the bed you want to change the setting for.

2) Touch “Menu” to display the Menu screen.



3) Touch “Indiv. Bed Screen Setup” to display the setting window.

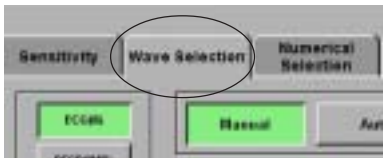
2. Select the parameter you want to set the sensitivity or scale of and touch the desired sensitivity or scale key.

Selecting the Parameter of the Displayed Waveform on the Wave Display Window

Select the parameter of the waveform to be displayed on the right side of the Wave Display Window. Up to 8 waveforms (11 waveforms on the Expand Individual Bed screen) can be displayed.

- Auto: The parameter of the automatically selected waveform is displayed on the Wave Display window. Automatic selection is based on the parameter priority and changes according to the situation.
- Manual: The parameter of the manually selected waveform is displayed on the Wave Display window.

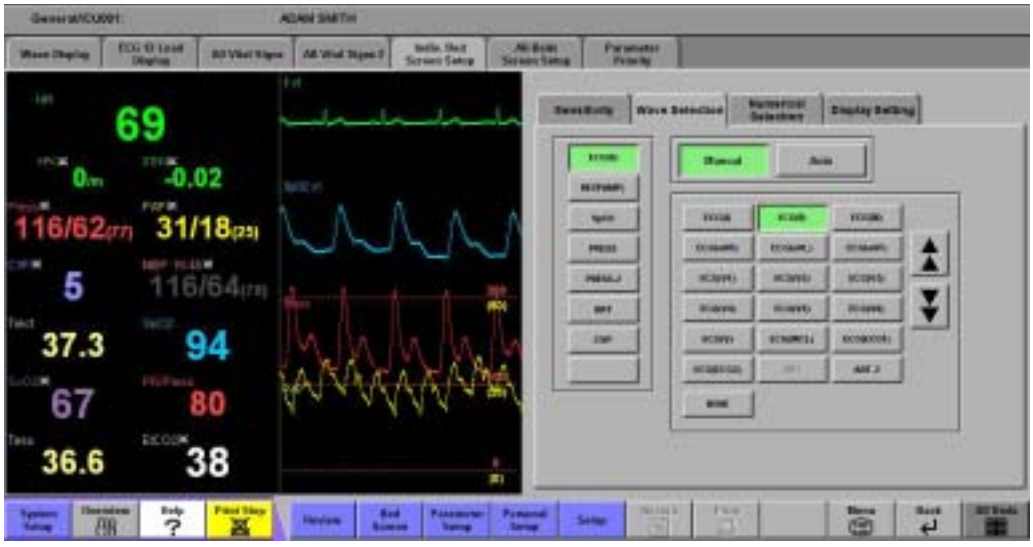
1. Display the Individual Bed screen Setup window.



2. Touch “Wave Selection”.

3. Select whether the parameter of the waveform is to be set manually or automatically.

- Auto: The displayed parameter(s) are automatically selected from the currently measured parameters according to the parameter priority. Up to 8 waveforms (11 waveforms on the Expand Individual Bed Screen) can be displayed for a patient. The number of waveforms is not selectable.
- Manual: Select the parameter(s) of each display area.
  Up to 8 waveforms (11 waveforms on the Expand Individual Bed screen) can be displayed for a patient.
  You can choose the parameter(s) to be displayed on the Wave Display window from the currently measured parameter(s) or the parameter(s) selected on the Parameters window of the System Setup screen. On the left window, you can confirm the display on the Wave Display window.



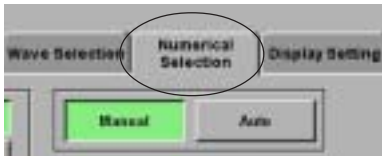
Selecting the Measurement Data Displayed on the Wave Display Window

Select the measurement data to be displayed on the left side of the Wave Display window, ECG 12 Lead Display window and All Vital Signs window. Up to 11 numeric data (13 numeric data on the Expand Individual Bed screen) can be displayed.

- Auto: The automatically selected parameter of the measurement data displayed on the Wave Display window, ECG 12 Lead Display window and All Vital Signs window. Automatic selection is based on the parameter priority and changes according to the situation.
- Manual: The manually selected parameter of the measurement data is displayed on the Wave Display window, ECG 12 Lead Display window and All Vital Signs window.

The first parameter is displayed in large size and the other parameters are displayed in the remaining area in equal size.
However, when you select the S/D/M display format of blood pressure measurement values (Refer to Section 12), it is displayed as large as possible. When the first parameter is HR, VPC and ST are also displayed.

1. Display the Individual Bed screen setup window.



2. Touch “Numerical Selection”.

3. Set whether the parameter of the measurement data is to be selected manually or automatically.

- Auto: The displayed parameter(s) are automatically selected from the currently measured parameters according to the display priority. Up to 11 numeric data (13 numeric data on the Expand Individual Bed screen) can be displayed for a patient. The number of measurement data isn’t selectable.

NOTE

The measurement value may not follow the parameter priority when displaying S/D/M format blood pressure measurement values.

- Manual: Select the parameter display order.
  Touch the key of the parameter to display its numeric data. You can choose the parameter(s) to be displayed on the Wave Display window, ECG 12 Lead Display window and All Vital Signs window from currently measured parameter(s) or the parameter(s) selected on the Parameters window of System Setup screen. On the left window, you can confirm the display on the each window.

NOTE

When you select the S/D/M display format of the blood pressure measurement values, the blood pressure measurement value is displayed widely. Therefore, some selected parameters may not displayed.

Changing the Sweep Speed

Select the sweep speed of the waveforms other than the respiration waveform.

1. Display the Indiv. Bed Screen Setup window. (Refer to 8.6)
2. Touch “Display Setting” to display the setting window.
3. Touch “25” or “50”.

Changing the Sweep Speed of the Respiration Waveform

Select the sweep speed of respiration (RESP), CO_2, Flow, VOL, Paw and Agent waveform. Speed for the upper button corresponds to the setting at “Sweep Speed”.

1. Display the Indiv. Bed Screen Setup window. (Refer to 8.6)
2. Touch “Display Setting” to display the setting window.
3. Touch “25” (When the sweep speed setting of previous section is 50 mm/s, the display of this tab changes to 50) or “6.25”.

Changing the IBP Waveform Display Mode

There are two ways to display IBP waveforms on the screen.

Common: Both IBP waveforms are displayed on the same scale. You can move the cursor up and down with the upward and downward arrow keys on the keyboard.

Separate: IBP waveforms are displayed separately on different scales.

1. Display Indivi. Bed Screen Setup window. (Refer to 8.6)
2. Touch “Display Setting” to display the setting window.
3. Touch “Separate” or “Common”.

Setting on Data Display Windows of the Indiv. Bed Screen

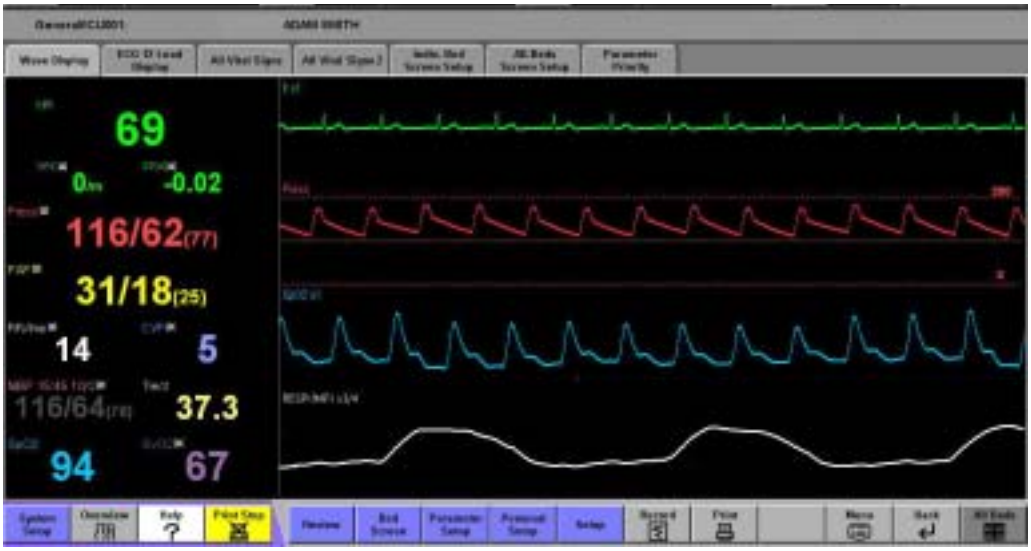
Selecting the Waveform Sensitivity and Scale on the Wave Display Window

NOTE

The waveform sensitivity and scale setting on Wave Display windows of the Individual Bed screen links to the setting on the Individual Bed Screen Setup window and All Bed screen display.

1. Display the Wave Display window.

2. Touch the waveform you want to set the sensitivity or scale of. The setting window opens.



3. Touch the desired sensitivity or scale key.

Setting Vital Sign Alarms and Measurement Conditions for the Parameters Displayed on the Individual Bed Screen

Set the vital sign alarm and measurement conditions for the numeric data to be displayed on the left side of the Wave Display window, ECG 12 lead display window and All Vital Signs window.

1. Display the Individual Bed screen.
2. On the screen, touch a numeric data for which you want to set the vital sign alarm and measurement condition. The setting window for the parameter opens.

Example: ECG window

For setting procedure, refer to section 12.

Changing the All Bed Screen Display Setting

To open the All Bed Screen Setup window, touch the All Bed Screen Setup tab on the Individual Bed screen. For the details of each setting item, refer to Section 7 “Changing the All Beds Screen Display Setting”.

Setting Parameter Priority

Parameters are displayed according to the parameter priority set in Auto function on the Individual Bed screen. Automatic selection is based on the parameter priority and changes according to the situation. Refer to Section 7 for the setting.

Recording on the Individual Bed Screen

Dual Waveform Recording

Two waveforms of the preset recording period and the numeric data of the recording start time are recorded with the WS-971R recorder unit. Waveforms to be recorded are selected on the Recording window of the Individual Bed screen.

Touch “Record” on the Individual Bed screen to start dual waveform recording.

During recording, the “Record” key changes to “REC Stop”. To stop recording, touch “REC Stop”.

Necessary Settings

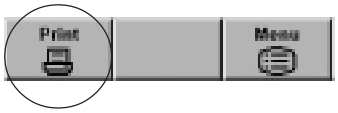
1. At “Recording Pattern” on the Recording window of the Setup, select two parameters for the waveforms to be recorded. (When “Second Wave” is set to None, only one waveform is recorded.)

2. Set the record sweep speed at “Other” on the recording window of the Setup.
3. Set the recording period at “Manual Recording” on the Recording window on the System Setup.

NOTE

When you perform dual waveform recording while freezing waveforms, the recording period is fixed to 6 seconds and the recorded waveforms are those frozen and displayed on the screen.

Multi-Wave Printing



All displayed waveforms and numeric data on the Wave Display window are printed on one A4 or letter size page by the laser printer. Each waveform is 10 seconds. On the Wave Display window, touch “Print”. When printing of all waveforms is finished, printing automatically stops.

To cancel printing, touch “Print Stop”.

NOTE

When you perform multi waveform printing while freezing waveforms, the printing period is fixed to 6 seconds and the printing waveforms are those frozen and displayed on the screen.

Necessary Setting

Set the record sweep speed at “Other” on the recording window of the Setup.

ECG 12 Lead Printing

All ECG waveforms (maximum 12 leads) displayed on the ECG 12 Lead Display window are printed on one A4 or letter size page by the laser printer.
Touch “Print” on the ECG 12 Lead Display window. When printing of all waveforms is finished, printing automatically stops.

To cancel printing, touch “Print Stop”.

Necessary Setting

1. Select printing format (number of leads × number of traces) of the all ECG waveforms (maximum 12 leads) display at the ECG 12 Printing Format on the System Configuration window of the System Setup.
2. Set the record sweep speed at “Other” on the recording window of the Setup.

NOTE

When you select 3rows × 4cols in ECG 12 Lead Printing Format, the record sweep speed is fixed to 25 mm/s regardless of the recording sweep speed setting in “Other” on the Recording window in Setup.

Other Recordings

On the Individual Bed screen, the following recordings are also available with the WS-971R recorder unit.

Manual Recording:	Delayed recording
Automatic recording:	Periodic recording, Alarm recording
Call recording	
Remote recording	

Section 9 Review Windows

Overview of Review Windows

Overview 9.0.1
Displaying the Review Window 9.0.1
Common Description of Review Windows 9.0.2
Example: Trend window 9.0.2

Overview

You can review saved data of a monitored bed on the following windows.

For data display:

- Trend window
- Tabular Trend window
- Hemodynamics List window
- Arrhythmia Recall window
- ST Recall window
- Full Disclosure window
- ECG 12 Lead Analysis window
- Alarm History window

For report creation:

- Report window

When you change to a different Review window for data display, a cursor is displayed at the position of the corresponding time.

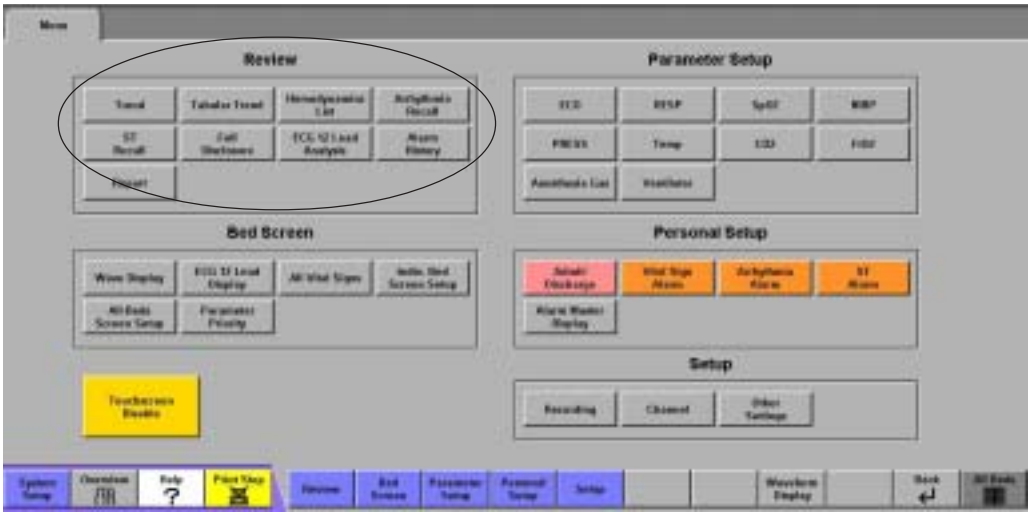
Displaying the Review Window

The same procedure is used to display each review window.

1. Touch the basic information area of the bed you want to display the review windows for.

2. Touch “Menu” to display the Menu screen.

3. Touch the key for each review window you want to display.

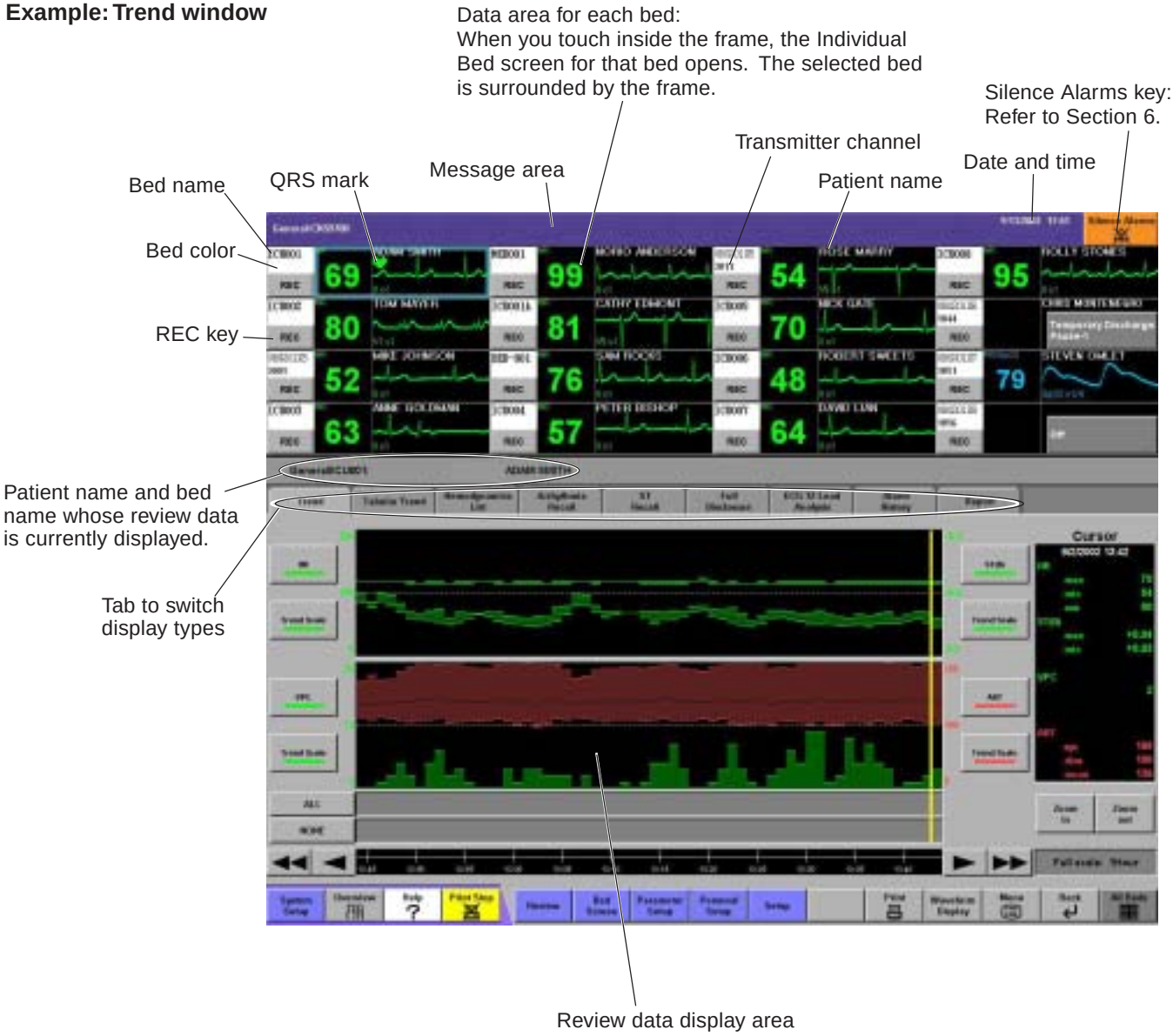


Common Description of Review Windows

Each review window consists of a basic information area (upper half of the screen) and review data display area (bottom half of the screen). On the basic information area, one numeric data and waveform for each monitored patient is displayed.

On the Expand Individual Bed screen in dual display composition, only review data is displayed. Therefore, display data area is large. Refer to the section of each window.

Example: Trend window


Data area for each bed:
When you touch inside the frame, the Individual Bed screen for that bed opens. The selected bed is surrounded by the frame.
Silence Alarms key: Refer to Section 6.
Transmitter channel
Date and time
Patient name
Message area
QRS mark
Bed name
Bed color
REC key
Patient name and bed name whose review data is currently displayed.
Tab to switch display types
Cursor
Review data display area

Trend Window

Overview 9.1.1
- Displaying the Trend Window 9.1.1
- Window Description 9.1.2
  - Parameters and Display 9.1.3

Viewing Trend Window 9.1.6
- Scrolling the Trendgraph 9.1.6
- Viewing Numerical Data (Cursor Moving) 9.1.6
- Changing the Display Width of the Trendgraph 9.1.6

Changing the Trend Window Display Setting 9.1.7
- Setting the Displayed Parameters 9.1.7
- Changing the Scale 9.1.7
- Selecting Displayed Events 9.1.8

Printing Trendgraphs 9.1.9
- Other Recordings 9.1.9

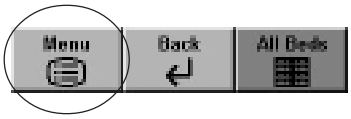
Overview

The Trend window displays trendgraphs of 4 parameters and 2 events of the most recent 72 hours. Measurement values of the measured parameters are displayed as trendgraphs.

The number of trendgraphs on the Expand Individual Bed screen in dual display composition is different from the number of trendgraphs on the regular screen.
Number of parameters: maximum 6
Number of events: maximum 6

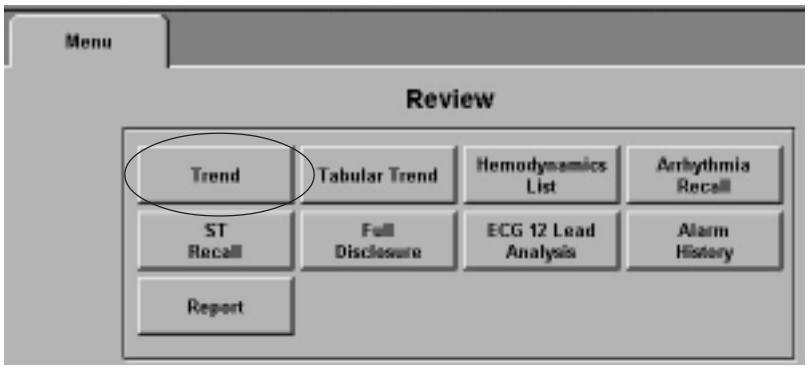
Displaying the Trend Window

1. Touch the basic information area of the bed you want to display the Trend window for.



2. Touch “Menu” to display the Menu screen.

3. Touch “Trend” to display the Trend window.



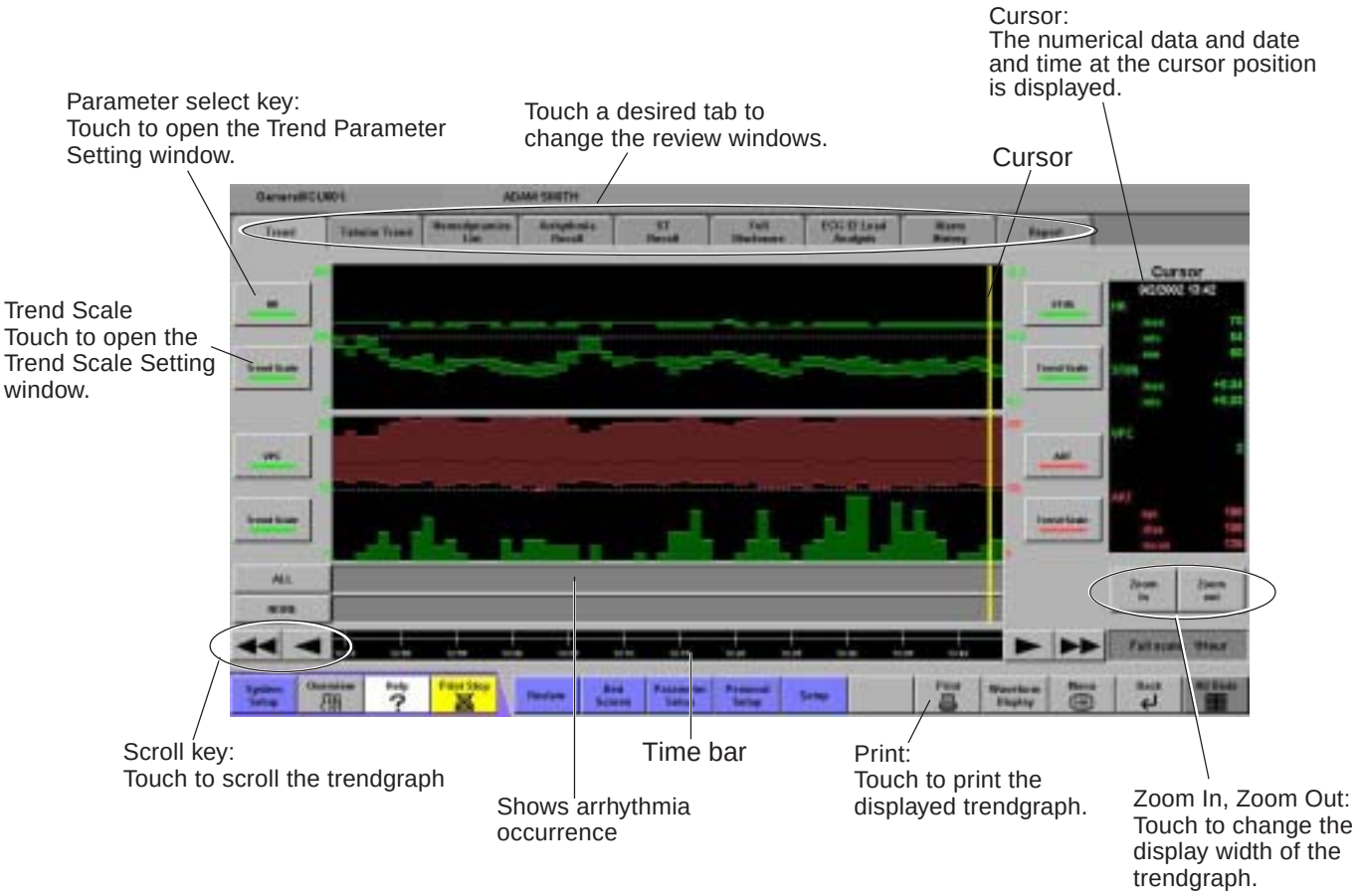
Window Description

Each parameter data is displayed in the color for each parameter.

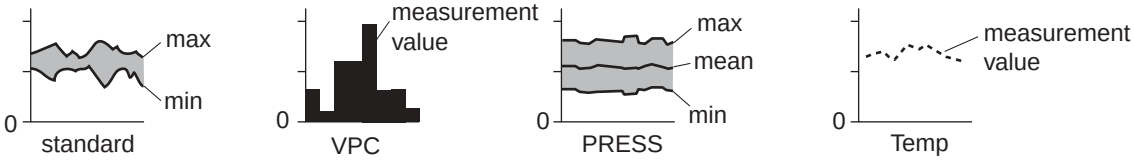
You can select either 1, 8, 24 or 72 hours for trendgraph display width.
The numerical data at the cursor is displayed.

You can select two of “ASYSTOLE”, “V-FIB”, “V. TACHY”, “VPC RUN”, “COUPLET”, “Off/Noise” and “ALL” for event trendgraphs. A mark is put at the time the selected event occurred.

For Expand Individual Bed screen in dual display composition, refer to “Overview” in this section.


Cursor:
The numerical data and date and time at the cursor position is displayed.
Parameter select key:
Touch to open the Trend Parameter Setting window.
Touch a desired tab to change the review windows.
Cursor
Trend Scale
Touch to open the Trend Scale Setting window.
Scroll key:
Touch to scroll the trendgraph
Shows arrhythmia occurrence
Time bar
Print:
Touch to print the displayed trendgraph.
Zoom In, Zoom Out:
Touch to change the display width of the trendgraph.

Parameters and Display



Parameter	Indication	Scale Range (bold: default)
HR	PRESS	0 - 100 **0 - 200** 0 - 300
VPC	VPC	**0 - 20** 0 - 50 0 - 100
ST (I, II, III, aVR, aVL, aVF, V1 to V6)	Standard	**–0.20 - +0.20** –0.50 - +0.50 –1.00 - +1.00
RR	VPC	**0 - 50** 0 - 150
CO_2	VPC	(mmHg) 0 - 40 **0 - 80**
		(kPa) 0.0 - 6.0 **0.0 - 12.0**
NIBP	PRESS	(mmHg) 0 - 100 **0 - 200** 0 - 300
		(kPa) 0.0 - 16.0 **0.0 - 32.0** 0.0 - 40.0
SpO_2	VPC	0 - 100 50 - 100 **80 - 100**
FiO_2, EtO_2		0 - 100 **0 - 60** 30 - 60
MV		0 - 6 **0 - 12** 0 - 30
TV		0 - 500 **0 - 1000** 0 - 2000
Paw	TEMP	0 - 10 0 - 20 **0 - 50** 0 - 100 0 - 150
PR	VPC	**0 - 200** 0 - 300

Parameter	Indication	Scale Range (bold: default)
ART, ART-2, RAD, DORS, AO, FEM, LVP, PRESS, PRESS-2 to PRESS-8, UA, CNIBP	PRESS	(mmHg) 0 - 20 0 - 50 0 - 100 **0 - 200** 0 - 300
		(kPa) 0.0 - 4.0 0.0 - 8.0 0.0 - 16.0 **0.0 - 32.0** 0.0 - 40.0
PAP, RAP, RVP, CVP, LAP, ICP, ICP-2 to ICP-4, UV	PRESS	(mmHg) 0 - 20 **0 - 50** 0 - 100 0 - 200 0 - 300
		(kPa) 0.0 - 4.0 **0.0 - 8.0** 0.0 - 16.0 0.0 - 32.0 0.0 - 40.0
BIS	TEMP	**50 - 100** 0 - 100
Tskin, Tskin-2, Tskin-3, Trect, Tcore, Tnaso, Teso, Ttump, Taxil, Tblad, Temp, Temp-2 to Temp-8, Tb, Tb(CCO), CCO(Tb)	TEMP	(ºC) 0 - 40.0 15.0 - 64.0 20.0 - 40.0 30.0 - 34.0 **34.0 - 40.0**
		(ºF) 20 - 120 80 - 120 **92 - 104** 52 - 92 84 - 92
$S\bar{v}O2$, $S\bar{v}O2$(CCO)	VPC	**60 - 80** 60 - 100
CCO	VPC	4.00 - 6.00 **0.00 - 10.00** 0.00 - 20.00
tcPO2, tcPCO2	VPC	(mmHg) 0 - 100 **0 - 200** 0 - 800
		(kPa) 0.0 - 16.0 **0.0 - 32.0** 0.0 - 128.0
FiAGENT, EtAGENT, EtHAL, FiHAL, EtISO, FiISO, EtENF, FiENF, EtDES, FiDES, EtSEV, FiSEV	VPC	**0.0 - 6.0** 0.0 - 10.0 0.0 - 20.0
FiN2O(ANES)	VPC	**0 - 80** 0 - 100 50 - 100
RR(ANES), RR(VENT)	VPC	**0 - 50** 50 - 150

Parameter	Indication	Scale Range (bold: default)
EtCO2(ANES), EtCO2(VENT)	VPC	(mmHg) 0 - 40 **0 - 80**
		(kPa) 0.0 - 6.0 **0.0 - 12.0**
FiO2(ANES), FiO2(VENT)	VPC	0 - 60 **30 - 60** 0 - 100
Pmin(VENT), Pmean(VENT), PEEP(VENT), Ppeak(VENT)	TEMP	0 - 10 0 - 20 **0 - 50** 0 - 100 0 - 150
Rrspo(VENT)	VPC	**0 - 50** 0 - 150
MVspo(VENT), MV(VENT)		0.0 - 6.0 **0.0 - 12.0** 0 - 30.0
SEF		0.0 - 15.0 **0.0 - 30.0** 0.0 - 60.0
TP		0.00 - 0.10 0.00 - 0.50 0.00 - 1.00 0.00 - 5.00 **0.00 - 10.0**

Viewing Trend Window

Scrolling the Trendgraph

Touch the following keys to scroll the trendgraph.

"◀◀" "▶▶" : Scrolls by one page.

"◀" "▶": Scrolls by one minute*

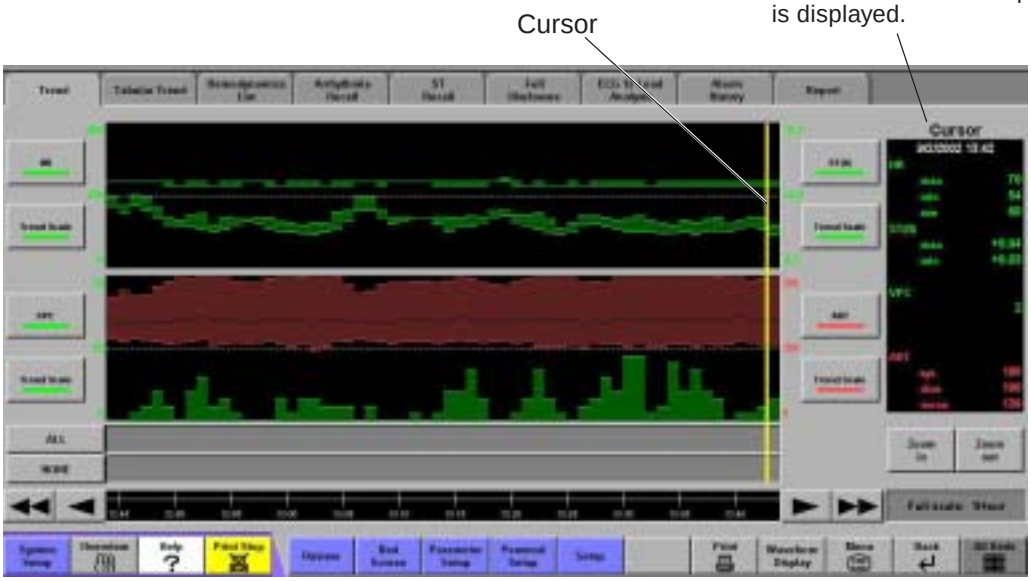
*The step depends on the display time width.

By touching the time bar, you can jump to the trendgraph at the touched time.

Viewing Numerical Data (Cursor Moving)

The numerical data at the cursor position is always displayed. You can view the numerical data of particular date and time by moving the cursor to the date and time. To move the cursor, touch "◀", "▶", "◀◀" or "▶▶" or touch directly on the trendgraph or time bar.

Cursor:
The numerical data and date and time at the cursor position is displayed.



Changing the Display Width of the Trendgraph

You can change the display width of the trendgraph. The display width changes so that the cursor is centered in the trendgraph.

Touch "Zoom in" to decrease the trendgraph display width.

Touch "Zoom out" to increase the trendgraph display width.

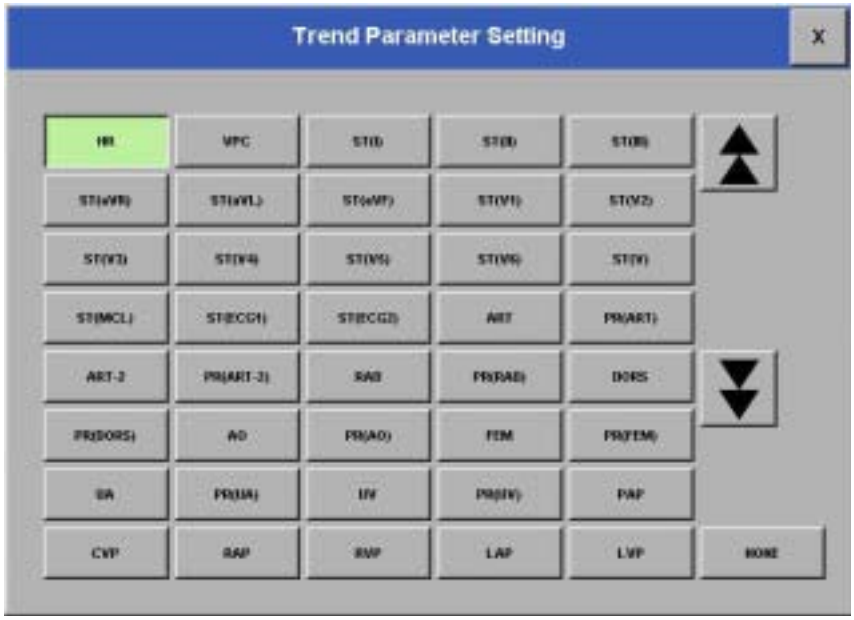
Changing the Trend Window Display Setting

Setting the Displayed Parameters

Do the procedure below to change the displayed parameter, change the display position or stop displaying parameters.

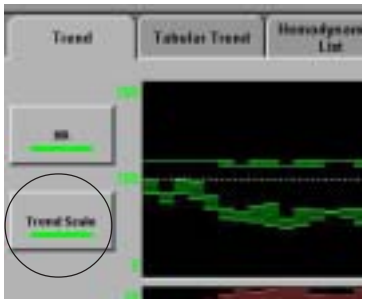
1. Touch the Parameter select key on the position you want to change the displayed parameter. The Trend Parameter Setting window opens. Parameters which are currently measured are displayed. When the parameter you want to choose is not displayed, first register it on the Parameter window of the System Setup.

2. Touch the key of the parameter you want to display. Touch “NONE” to select nothing.



3. Touch “⊠” to close the window.

Changing the Scale



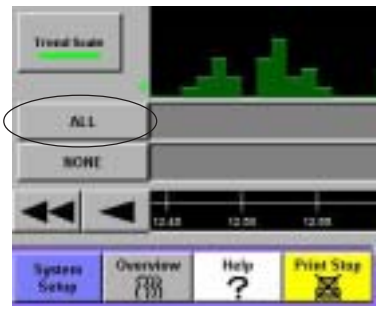
You can change the scale for the displayed trendgraph.

1. Touch “Trend Scale” of the trendgraph you want to change the scale of. The Trend Scale Setting window opens.

2. Touch the desired scale.

3. Touch “⊠” to close the window. The trendgraph with the changed scale is displayed.

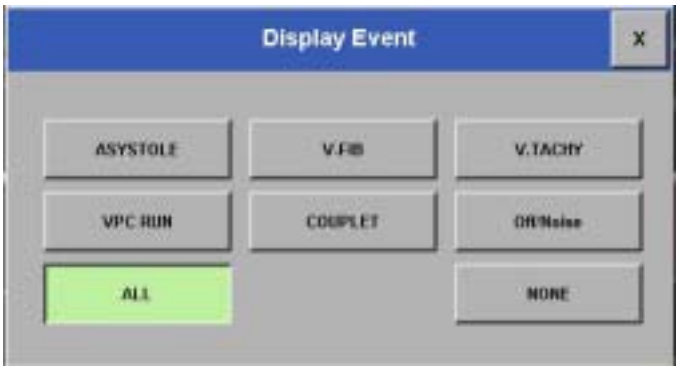
Selecting Displayed Events



Select the events to be displayed as trendgraphs. You can select up to two events. Up to 6 events are selectable on the Expand Individual Bed screen in dual display composition.

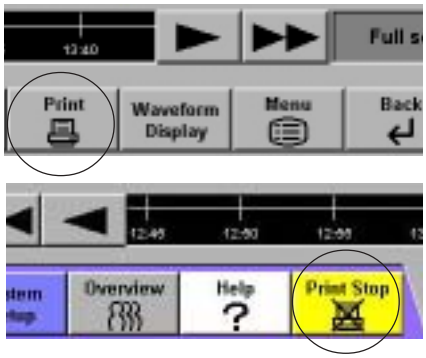
1. Touch the Select event key to display the Display Event window.

2. Touch the key of the event you want to display. Touch “NONE” to select nothing.



3. Touch “⊠” to close the window.

Printing Trendgraphs



The displayed trendgraphs are printed by the laser printer. Touch “Print” to print trendgraphs.

To stop printing, touch “Print Stop”.

Other Recordings

The following recordings are also available on the Trend window with the WS-971R recorder unit.

Manual Recording: Delayed recording

Automatic recording: Periodic recording, Alarm recording

Call recording

Remote delayed recording

Tabular Trend Window

Overview 9.2.1
- Displaying the Tabular Trend Window 9.2.1
- Window Description 9.2.2

Viewing the Tabular Trend Window 9.2.3
- Scrolling the Tabular Trend 9.2.3
- Displaying a Different Tabular Trend 9.2.3

Changing the Tabular Trend Window Display Setting 9.2.4
- Changing the Display Interval 9.2.4
- Setting the Patterns of Tabular Trend 9.2.4
  - Selecting Parameters for Each Tabular Trend 9.2.4
  - Registering Names for Each Tabular Trend 9.2.6

Printing Tabular Trend 9.2.7
  - Other Recordings 9.2.7

Overview

The Tabular Trend window displays tabular trend of measured parameters of the most recent 72 hours.

Displaying the Tabular Trend Window

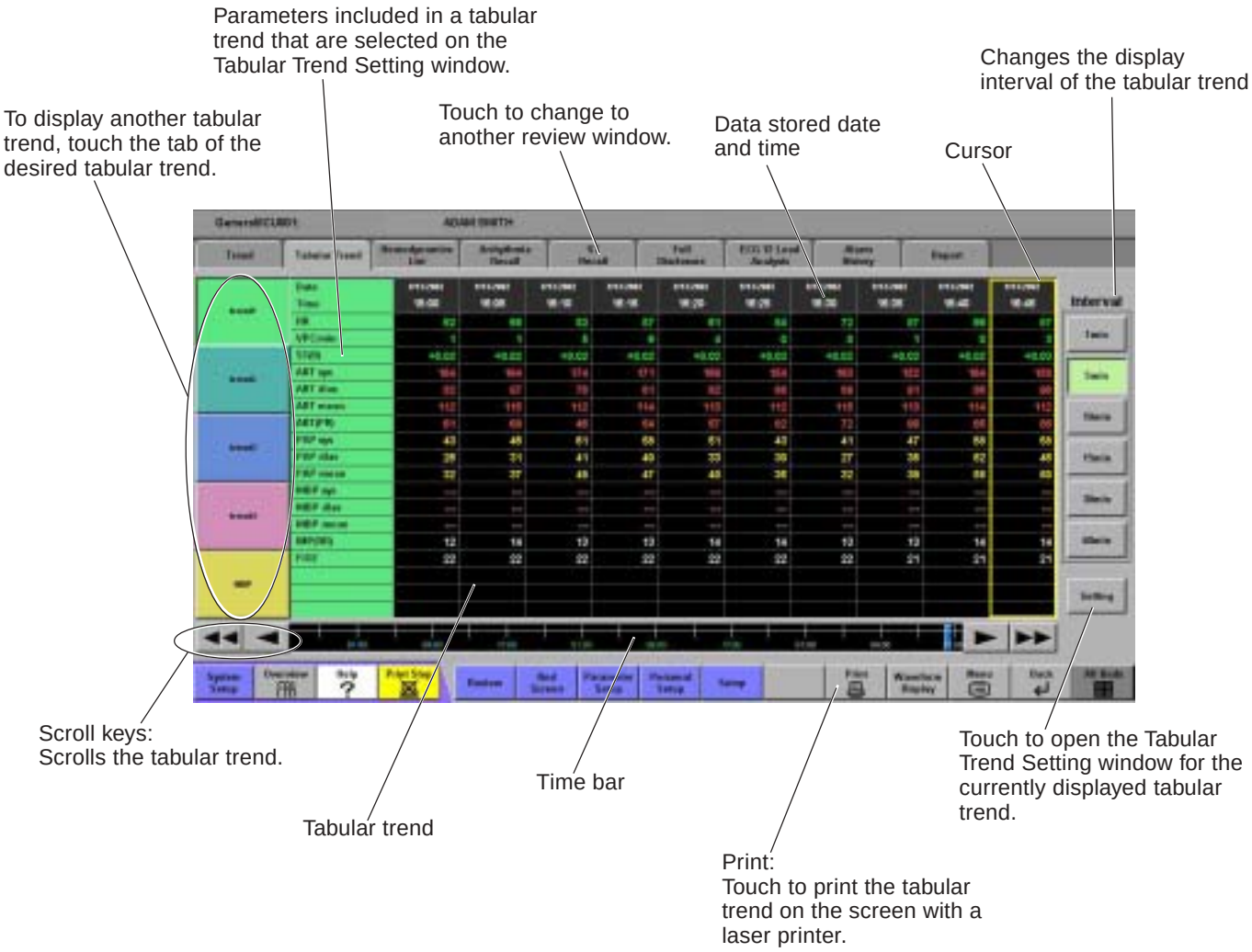
1. Touch the basic information area of the patient you want to display the Tabular Trend window of.

2. Touch “Menu” to display the Menu screen.

3. Touch “Tabular Trend” to display the Tabular Trend window.

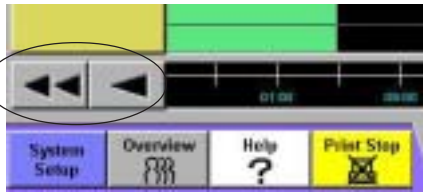
Window Description

Ten rows of tabular trend are displayed at the same time. The numerical data is updated every one minute. You can select the time width on the screen.
The numerical value is displayed in the color for each parameter.
The blood pressure and temperature are displayed by their labels.


Parameters included in a tabular trend that are selected on the Tabular Trend Setting window.
Changes the display interval of the tabular trend
To display another tabular trend, touch the tab of the desired tabular trend.
Touch to change to another review window.
Data stored date and time
Cursor
Scroll keys:
Scrolls the tabular trend.
Tabular trend
Time bar
Touch to open the Tabular Trend Setting window for the currently displayed tabular trend.
Print:
Touch to print the tabular trend on the screen with a laser printer.

Viewing the Tabular Trend Window

Scrolling the Tabular Trend



Touch the following keys to scroll the tabular trend.

"◀◀" "▶▶" : Scrolls by one page.

"◀" "▶": Scrolls by one row.

By touching the time bar, you can jump to the tabular trend at the touched time.

Displaying a Different Tabular Trend

To display another tabular trend, touch the tab of the desired tabular trend.

Five patterns of tabular trend can be registered in advance at the Tabular Trend Setting window.

You can select up to 18 parameters for each pattern of tabular trend.

Up to 30 parameters for each pattern of tabular trend is selectable on the Expand Individual Bed screen in dual display composition.

Changing the Tabular Trend Window Display Setting

Changing the Display Interval

NOTE

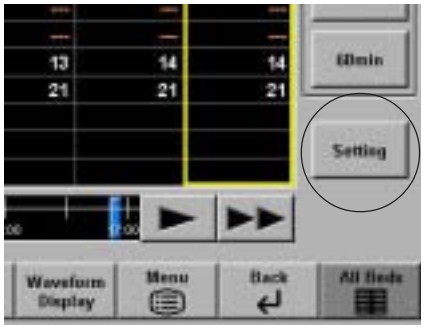
- **This setting only affects display. The data is saved every one minute.**
- **The NIBP Tabular Trend displays measurement values acquired at NIBP measurement. You cannot change the display interval.**

Touch a key at “Interval” to change the display interval of the tabular trend. After changing, the tabular trend is displayed in the selected interval.

Setting the Patterns of Tabular Trend

You can register five patterns of tabular trend on the Tabular Trend Setting window.

One of these patterns is fixed to NIBP tabular trend. Up to 18 parameters can be assigned to each pattern of tabular trend. Up to 30 parameters can be assigned to each pattern of tabular trend on the Expand Individual Bed screen.



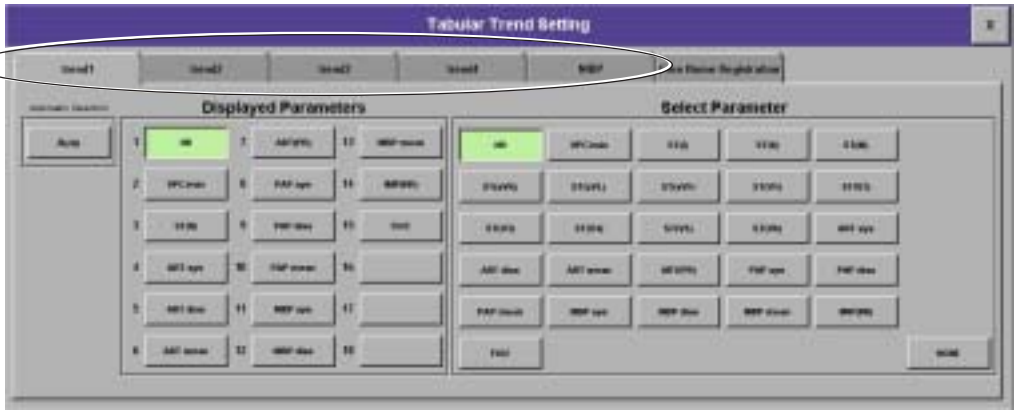
You can choose the parameter(s) to be displayed on each tabular trend from currently measured parameters or the parameter(s) selected on the Parameter window of the System Setup screen.

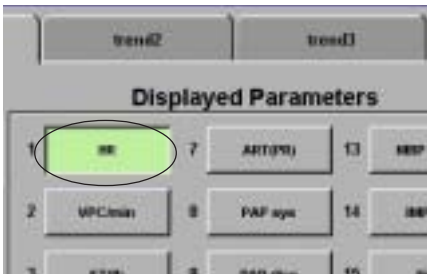
To display another tabular trend, touch the tab of the desired tabular trend.

Selecting Parameters for Each Tabular Trend

1. Touch “Setting” to display the Tabular Trend Setting window.

2. Touch the tab of the desired tabular trend to display it.

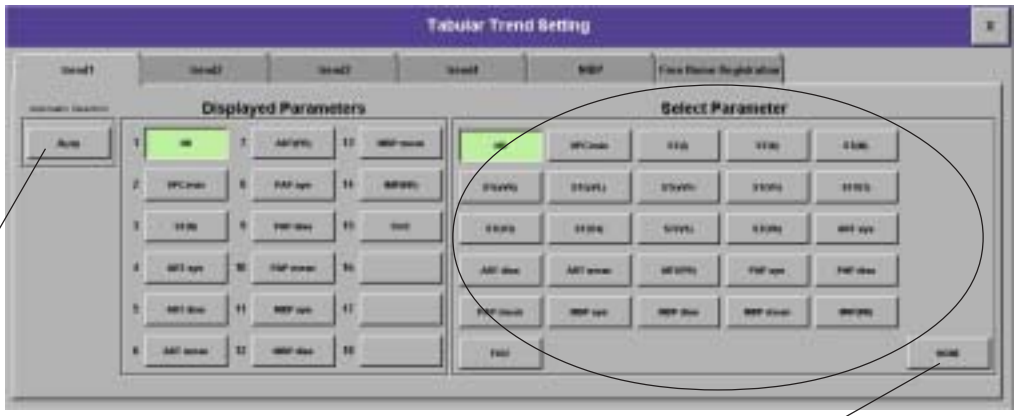




3. In “Displayed Parameters”, touch the key for the position you want to change the parameter for. They are displayed at 1 to 18 in order on the Tabular Trend window.

   For NIBP tabular trend, three of 18 parameters are fixed to NIBP sys, NIBP dias and NIBP min.

4. Touch a parameter at “Select Parameter”. To select nothing, touch “NONE”.



Automatic selecting function:
Touch “AUTO” to automatically select displayed parameters from the currently measured data in the priority. For the priority, refer to Section 15.

NONE:
Touch NONE to unselect all items.
No parameter is displayed on the position.

You can select measuring labels and leads for PRESS, TEMP and ST.

5. Touch “⊠” to close the window.

Registering Names for Each Tabular Trend

1. Touch “Free Name Registration” on the Tabular Trend Setting window. The Free Name Registration window opens.

2. Touch the key of the tabular trend you want to name.

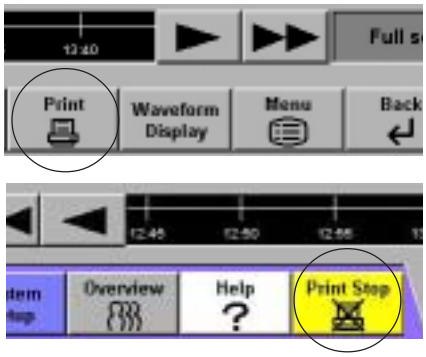
3. Enter a name on the screen using the keyboard.

NOTE

The list name “NIBP” can not be changed.

4. Touch “⊠” to close the window.

Printing Tabular Trend



The displayed tabular trend is printed by the laser printer. Touch “Print” to print tabular trend.

To stop printing, touch “Print Stop”.

Other Recordings

The following recordings are also available on the Tabular Trend window with the WS-971R recorder unit.

Manual Recording: Delayed recording

Automatic recording: Periodic recording, Alarm recording

Call recording

Remote delayed recording

Hemodynamics Window

Overview 9.3.1
Displaying the Hemodynamics List Window 9.3.1
Window Description 9.3.1
Viewing the Hemodynamics List Window 9.3.2
Scrolling the Hemodynamics List 9.3.2
Abbreviations 9.3.3
Printing the Hemodynamics List 9.3.4
Other Recordings 9.3.4

Overview

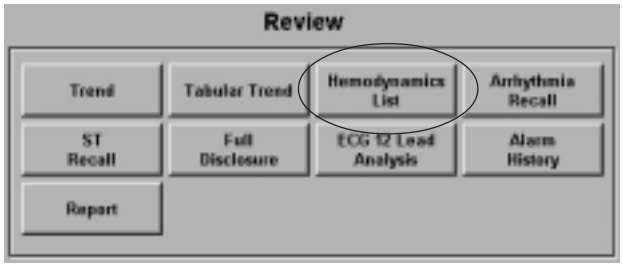
The hemodynamics list created on the bedside monitor can be viewed on the Hemodynamics List window.

Displaying the Hemodynamics List Window

1. Touch the basic information area of the bed you want to display the Hemodynamics List window for.

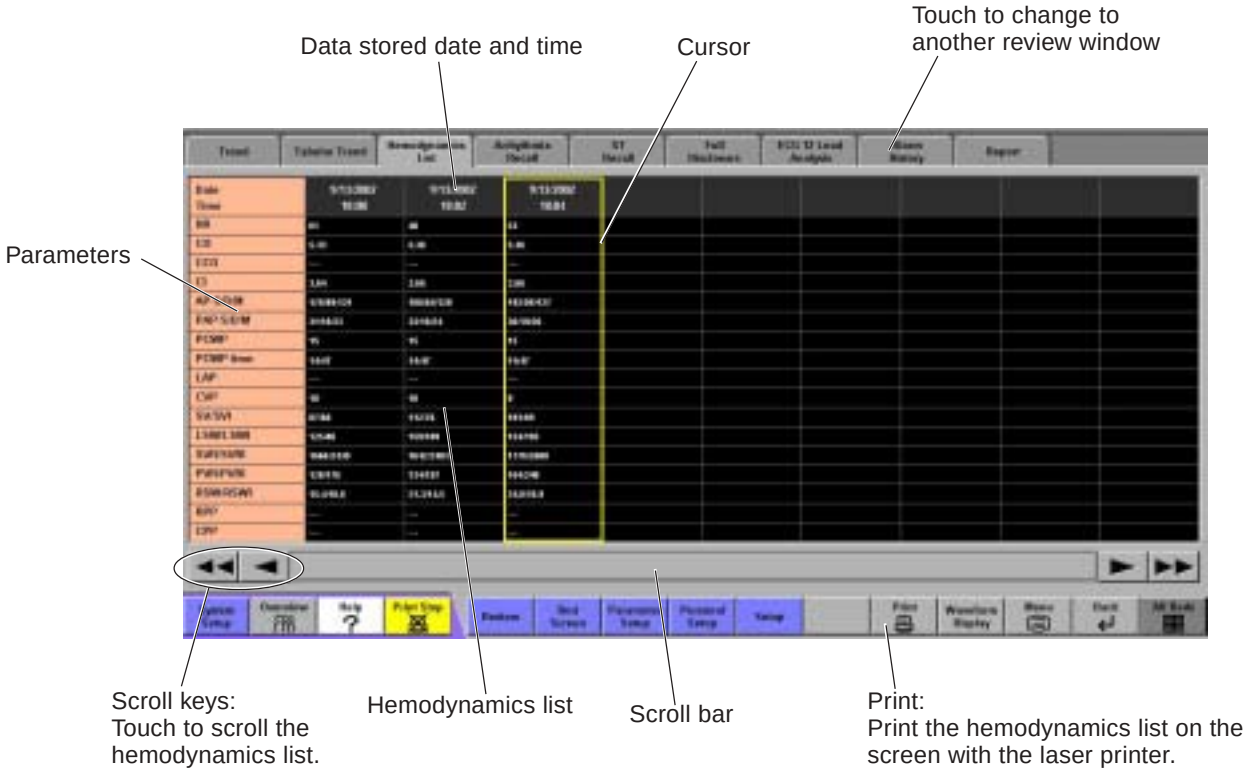
2. Touch “Menu” to display the Menu screen.

3. Touch “Hemodynamics List” to display the Hemodynamics List window.



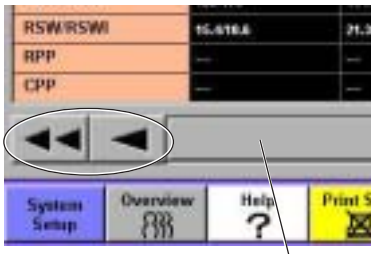
Window Description

A Hemodynamics List of up to 256 measurements can be displayed. 9 rows at a time are displayed.



Viewing the Hemodynamics List Window

Scrolling the Hemodynamics List



Touch the following keys to scroll the hemodynamics list.

"◀◀" "▶▶" : Scrolls by one page.
"◀" "▶": Scrolls by one row.

By touching the scroll bar, you can jump to the desired list.

Abbreviations

The following table shows the abbreviations, units and calculations of the parameters used in the hemodynamics data.

Abbreviation	Meaning	Units	Equation
HR	Heart Rate	min^{-1}	---
CO	Cardiac Output	$L \cdot min^{-1}$	---
CCO*	Continuous Cardiac Output	$L \cdot min^{-1}$	
CI	Cardiac Index	$L \cdot min^{-1} \cdot m^{-2}$	CI= CO / BSA**
AP_S	Arterial Systolic Pressure	mmHg	---
AP_D	Arterial Diastolic Pressure		
AP_M	Arterial Mean Pressure		
PAP_S	Pulmonary Systolic Pressure		
PAP_D	Pulmonary Diastolic Pressure		
PAP_M	Pulmonary Mean Pressure		
PCWP	Pulmonary Capillary Wedge Pressure		
LAP	Left Arterial Pressure		
CVP	Central Venous Pressure		
SVI	Stroke Volume Index	$mL \cdot m^{-2}$	$SVI = (CI \times 1000) / HR$
SV	Stroke Volume	mL	$SV = (CO \times 1000) / HR$
LSWI***	Left Ventricular Stroke Work Index	$g \cdot m \cdot m^{-2}$	$LSWI = (SVI \times (AMP - PCWP)) \times 0.0136$
LSW***	Left Ventricular Stroke Work	$g \cdot m$	$LSW = (SV \times (AMP - PCWP)) \times 0.0136$
SVRI	Systemic Vascular Resistance Index	$dyn \cdot s \cdot cm^{-5} \cdot m^{2}$	$SVRI = ((AMP - CVP) \times 80) / CI$
SVR	Systemic Vascular Resistance	$dyn \cdot s \cdot cm^{-5}$	$SVR = ((AMP - CVP) \times 80) / CO$
PVRI***	Pulmonary Vascular Resistance Index	$dyn \cdot s \cdot cm^{-5} \cdot m^{2}$	$PVRI = ((PAMP - PCWP) \times 80) / CI$
PVR***	Pulmonary Vascular Resistance	$dyn \cdot s \cdot cm^{-5}$	$PVR = ((PAMP - PCWP) \times 80) / CO$
RSWI	Right Ventricular Stroke Work Index	$g \cdot m \cdot m^{-2}$	$RSWI = (SV1 \times (PAMP - CV)) \times 0.0136$
RSW	Right Ventricular Stroke Work	$g \cdot m$	$RSW = (13.6 \times CO \times (PAMP - CVP) / HR$

* CCO is calculated instead of CO when CCO is measured.

** BSA = $0.007184 \times weight^{0.425} \times height^{0.725}$ (m^2) (DuBois equation)

*** "---" is displayed when PCWP is not measured.

Printing the Hemodynamics List

The displayed hemodynamics list is printed by the laser printer. Touch “Print” to print the hemodynamics list.

To stop printing, touch “Print Stop”.

Other Recordings

The following recordings are also available on the Hemodynamics List window with the WS-971R recorder unit.

Manual Recording: Delayed recording

Automatic recording: Periodic recording, Alarm recording

Call recording

Remote delayed recording

Arrhythmia Recall Window

Overview 9.4.1
- Displaying the Arrhythmia Recall Window 9.4.1
- Window Description 9.4.2
  - File List Window 9.4.2
  - Expanded Waveform Window 9.4.3

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- Scrolling the List of Arrhythmia Recall Files 9.4.4
- Sorting the List 9.4.4
- Displaying Expanded Arrhythmia Recall Waveform 9.4.4
  - Displaying Another File 9.4.5
  - Changing the Number of Waveforms 9.4.5
  - Scrolling Multiple Waveforms 9.4.6
  - Annotation List on the Expanded Waveform Window 9.4.6
- Measuring Arrhythmia Recall Waveform with Caliper 9.4.7
  - Changing Display Zoom and Sweep Speed 9.4.8
  - Selecting the Measured Waveform (Multiple Waveform Display Only) 9.4.8
  - Deleting All Measurement Results 9.4.8
  - Ending Caliper Measurement 9.4.8

Deleting Arrhythmia Recall Files 9.4.9
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- Deleting Unnecessary Arrhythmia Recall Files 9.4.9
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Setting Arrhythmia Recall File Creation 9.4.11
- Priority of Creating Arrhythmia Recall Files 9.4.11

Selecting the Arrhythmia Types Displayed on the File List 9.4.12

Recording on the Arrhythmia Recall Window 9.4.13
- Arrhythmia Recall Recording 9.4.13
  - Recording/Printing Displayed Files 9.4.13
  - Printing Files with Printing Marks 9.4.13
- Printing Caliper Measurement Data 9.4.14
- Other Recordings 9.4.14

Overview

The list of arrhythmia recall files (date and time the file is created, arrhythmia event, condensed arrhythmia recall waveform) is displayed on the Arrhythmia Recall window.

Up to 768 files can be created for the most recent 768 arrhythmias for each bed. One arrhythmia recall waveform is 8 seconds of ECG waveforms (10 seconds for some bedside monitors). An arrhythmia recall file is created so that the detected arrhythmia is displayed in the center of the recall waveform.

NOTE

To create arrhythmia recall files:

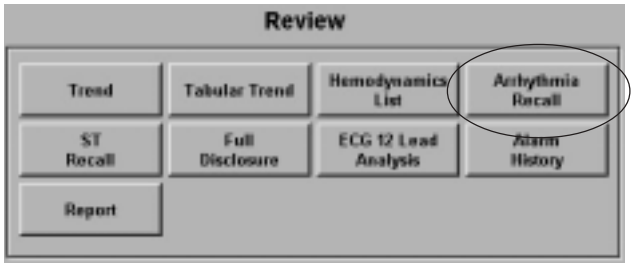
- **Arrhythmia analysis must be set to ON at the bedside monitor.**
- **For beds via the ORG-9200/9700 multiple patient receiver, arrhythmia analysis must be set to ON at the central monitor.**
- **"Recall" must be set to ON on the Arrhythmia Alarm window for the arrhythmia you want to save as recall files.**
- **When more than 768 files are already saved and another file is created, the oldest file is automatically deleted.**

Displaying the Arrhythmia Recall Window

1. Touch the basic information area of the bed you want to display the Arrhythmia Recall window for.

2. Touch "Menu" to display the Menu screen.

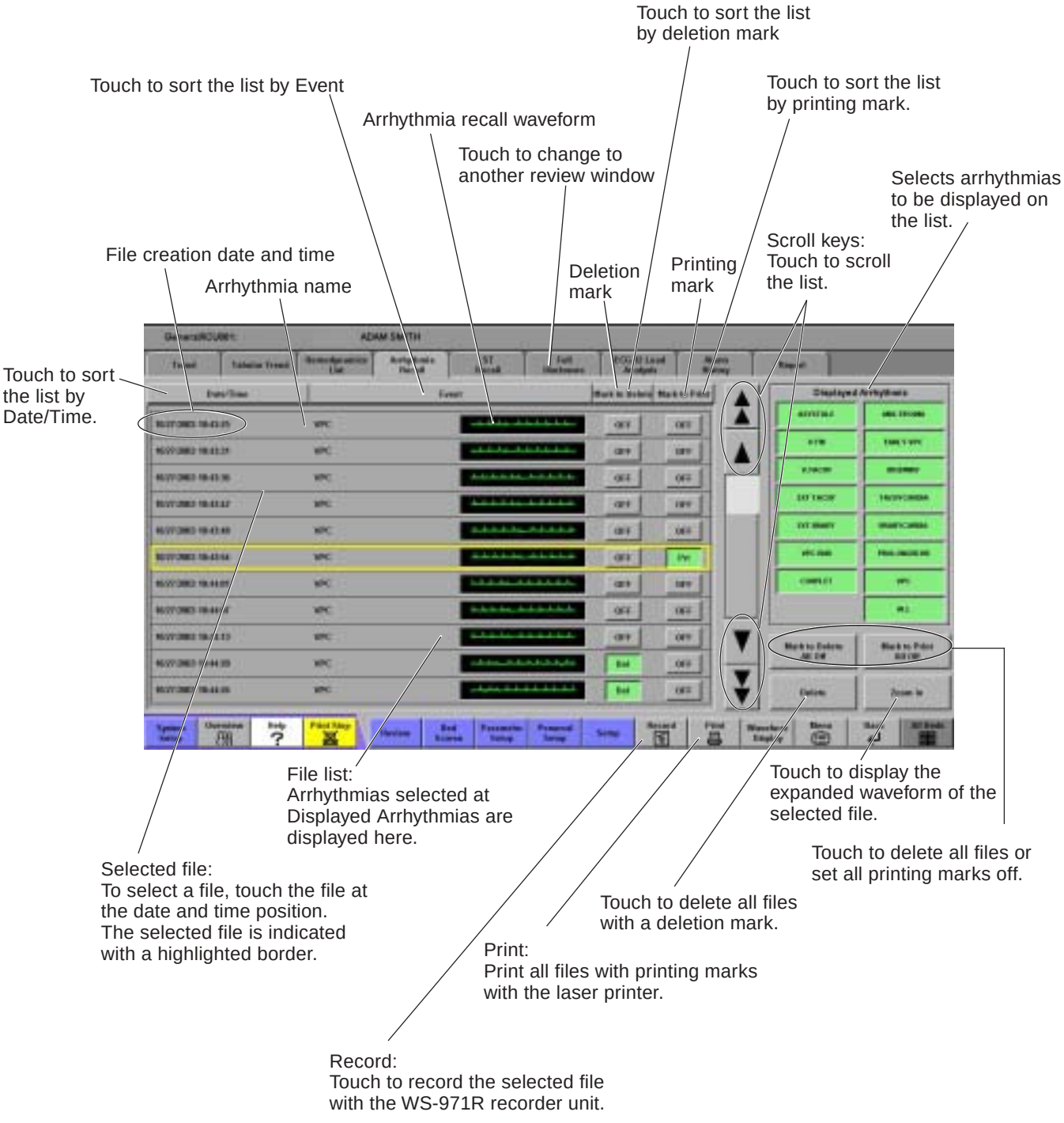
3. Touch "Arrhythmia Recall" to display the Arrhythmia Recall window.



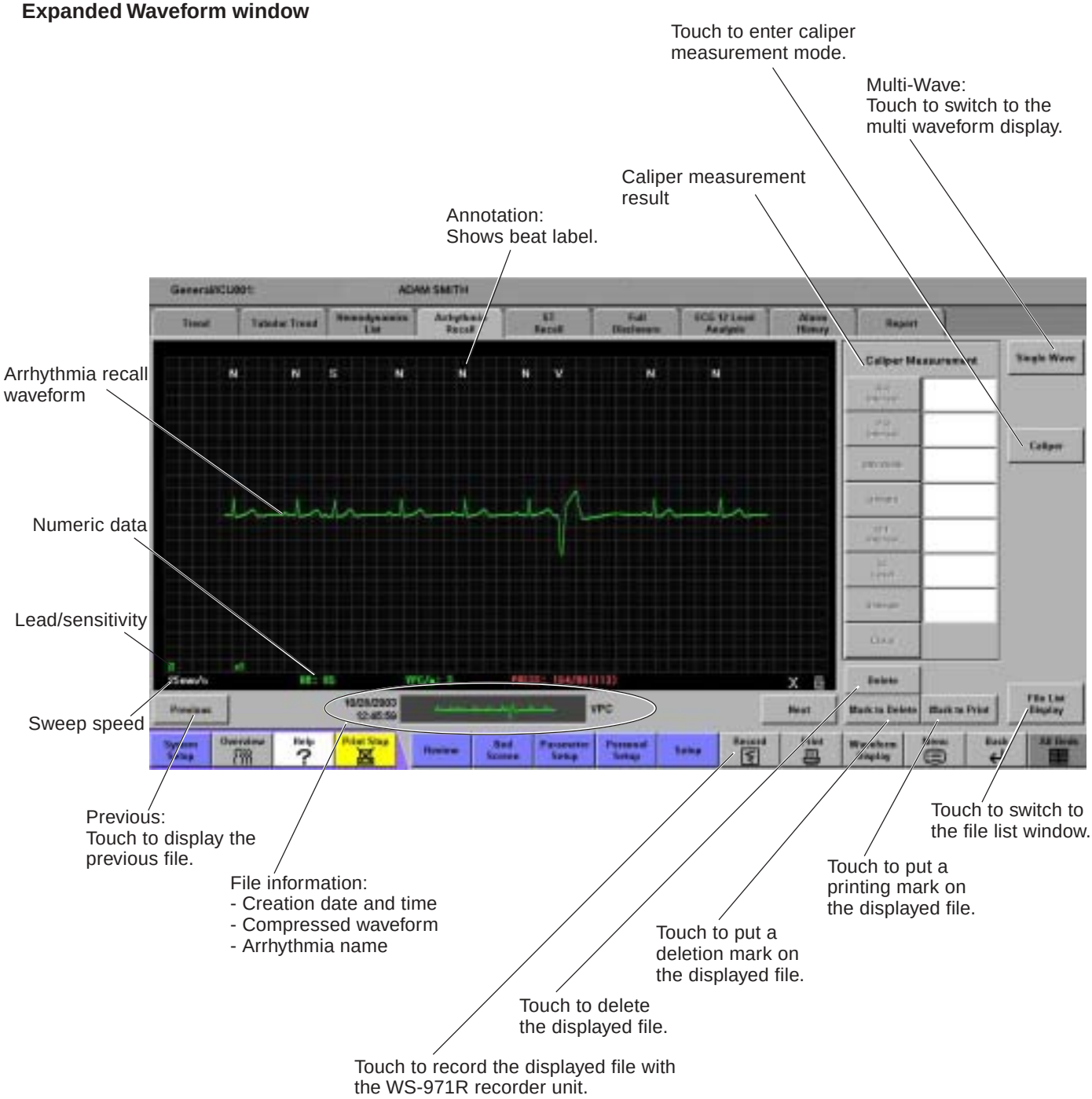
Window Description

The waveform can be expanded. You can individually put a deletion mark and/or printing mark for each file.

File List window


Touch to sort the list by deletion mark
Touch to sort the list by Event
Arrhythmia recall waveform
Touch to sort the list by printing mark.
Touch to change to another review window
Selects arrhythmias to be displayed on the list.
File creation date and time
Arrhythmia name
Deletion mark
Printing mark
Scroll keys: Touch to scroll the list.
Touch to sort the list by Date/Time.
File list: Arrhythmias selected at Displayed Arrhythmias are displayed here.
Touch to display the expanded waveform of the selected file.
Touch to delete all files or set all printing marks off.
Selected file: To select a file, touch the file at the date and time position. The selected file is indicated with a highlighted border.
Touch to delete all files with a deletion mark.
Print: Print all files with printing marks with the laser printer.
Record: Touch to record the selected file with the WS-971R recorder unit.

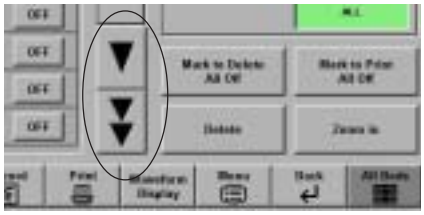
Expanded Waveform window


Touch to enter caliper measurement mode.
Multi-Wave: Touch to switch to the multi waveform display.
Caliper measurement result
Annotation: Shows beat label.
Arrhythmia recall waveform
Numeric data
Lead/sensitivity
Sweep speed
Previous: Touch to display the previous file.
File information: - Creation date and time - Compressed waveform - Arrhythmia name
Touch to record the displayed file with the WS-971R recorder unit.
Touch to delete the displayed file.
Touch to put a deletion mark on the displayed file.
Touch to put a printing mark on the displayed file.
Touch to switch to the file list window.

3 files are displayed on the Expand Individual Bed screen in dual display composition.

Viewing the Arrhythmia Recall Window

Scrolling the List of Arrhythmia Recall Files



Touch the following keys to scroll the file.

▲ ▼: Scrolls by one page.

▲ ▼: Scrolls by one file.

Up to 11 file lists are displayed on the regular screen.
Up to 18 file lists are displayed on the Expand Individual Bed screen in dual display composition.

Sorting the List

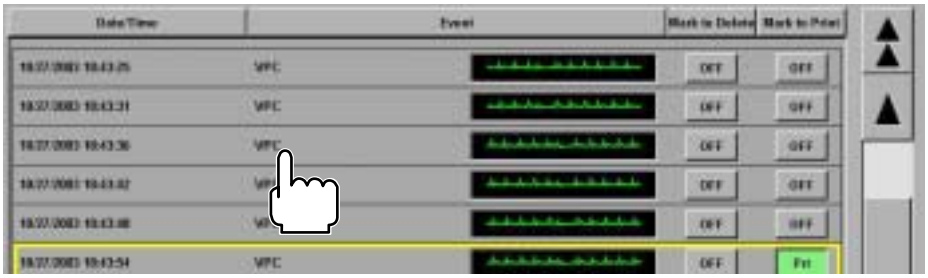
Touch an item on the title bar to sort the list by that item.

- Date/Time — Sort by file creation date and time
- Event — Sort by arrhythmia name
- Mark to Delete — Sort by deletion mark Del or OFF
- Mark to Print — Sort by printing mark Prt or OFF

Displaying Expanded Arrhythmia Recall Waveform

You can display the expanded arrhythmia recall waveform on the grid background.

Touch the file you want to expand at the “Event” position on the file list.



Touch to return to the file list window.

By touching “Zoom in” on the Arrhythmia Recall window, you can also display the expanded waveform of the selected file that is indicated with a highlighted border.

Displaying Another File

Touch “Previous” or “Next” to switch files.

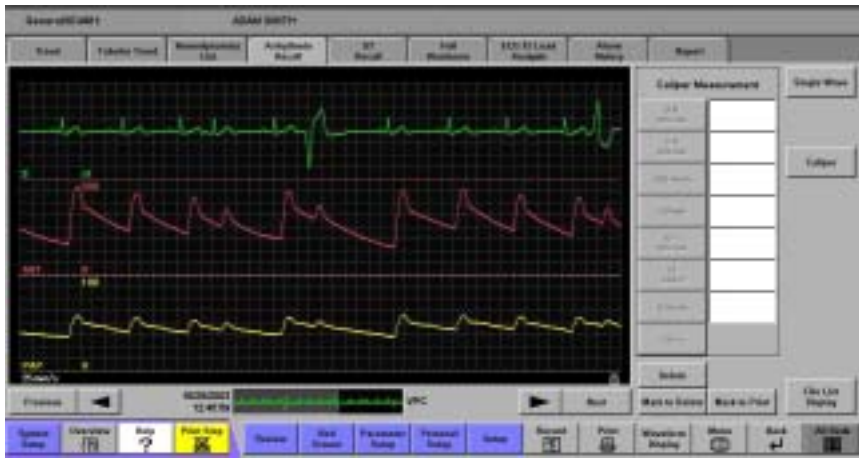
Changing the Number of Waveforms

NOTE

Multiple waveform display is only available when the QP-973P Full Disclosure Filing Program Kit is installed.

You can select either single waveform display or multiple waveform display on the Expanded Waveform window. Measurement with caliper are available on both display types.

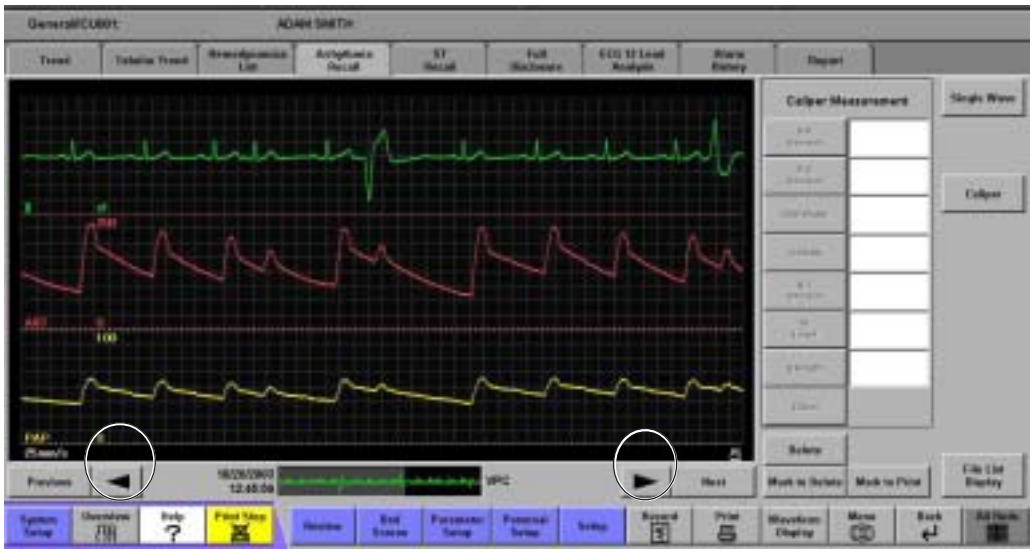
To select multiple waveform display, touch “Multi-Wave”. Waveforms displayed for the multiple waveform display are synchronized with the displayed waveform setting on the Full Disclosure window.



To return to single waveform display, touch “Single Wave”.

Scrolling Multiple Waveforms

When multiple waveform display is selected, a 10 second segment of the 16 seconds arrhythmia recall waveform is displayed on a grid background. Touch ◀ or ▶ to scroll the waveform.



You can also scroll the waveform by touching the desired position on the condensed arrhythmia recall waveform.

Annotation List on the Expanded Waveform window

Annotation	Meaning
N	Normal QRS Complex
S	Supraventricular Contraction
V	Ventricular Premature Contraction
A	Abnormal Beat
E	Early VPC
P	Paced QRS
—	QRS which cannot be analyzed because of noise, or QRS which is currently being learned
?	QRS which cannot be judged.

Annotations are not displayed for some beds depending on the bedside monitor type.

Measuring Arrhythmia Recall Waveform with Caliper

NOTE

Caliper measurement results are saved only when measuring on a central monitor where the bed's data is saved. When measuring on a central monitor where the bed's data is not saved, the "Caliper information is not saved" message appears on the screen.

On the expanded waveform window, you can measure the distance between any two points on an arrhythmia recall waveform.

1. Expand the arrhythmia recall waveform.

2. Touch "Caliper".

3. Touch the key of the measurement item you want to measure.

Item	Direction	Unit	Measured waveform
R-R (HR is also displayed)	Horizontal	R-R: sec HR: /min	All waveforms
P-R		msec	ECG
QRS-WIDTH			
Q-WIDTH			
Q-T			
ST	Vertical	mV	
Q-HEIGHT			

4. Touch any two points on the waveform. A line appears between the two points and the vertical or horizontal distance between the two points is displayed. To continuously measure another distance, touch any two points on the waveform. The previous measurement result disappears and the new measurement result is displayed.

NOTE

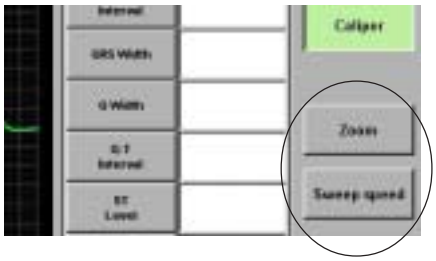
The line and measurement result on the waveform window disappear when you exit the caliper measurement mode.

Changing Display Zoom and Sweep Speed

On the caliper measurement window, you can change display zoom and sweep speed.

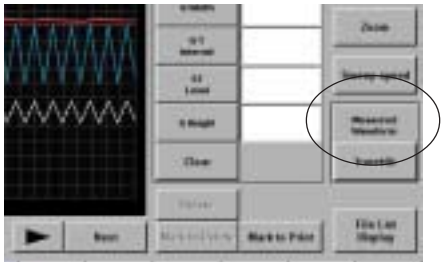
Zoom: ×1, ×2, ×4

Sweep speed: 25 mm/sec, 50 mm/sec



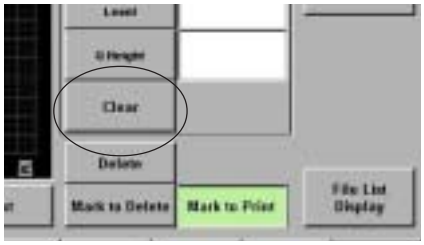
1. Touch “Zoom” or “Sweep speed” to open the setting window.
2. Touch the desired value.
3. Touch “⊠” to close the setting window.

Selecting the Measured Waveform (Multiple Waveform Display Only)



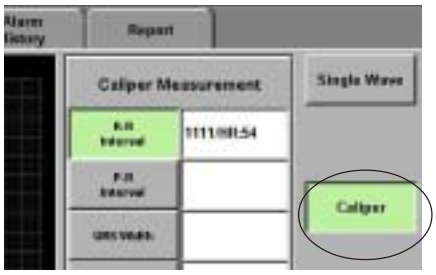
1. Touch the key at “Measured Waveform” to open the setting window.
2. Touch the key of the waveform you want to measure.
3. Touch “⊠” to close the setting window.

Deleting All Measurement Results



Touch “Clear” to delete all measurement results.

Ending Caliper Measurement



Touch “Caliper” to end caliper measurement. Measured values remain on the screen and saved unless they are deleted.

NOTE

Caliper measurement results are saved only when measuring on a central monitor where the bed’s data is saved. When measuring on a central monitor where the bed’s data is not saved, the “Caliper information is not saved” message appears on the screen.

Deleting Arrhythmia Recall Files

Automatic Deletion

Up to 768 files can be created for each bed. When more than 768 files are created, the oldest file is automatically deleted.

Deleting Unnecessary Arrhythmia Recall Files

You can select and delete unnecessary arrhythmia recall files.

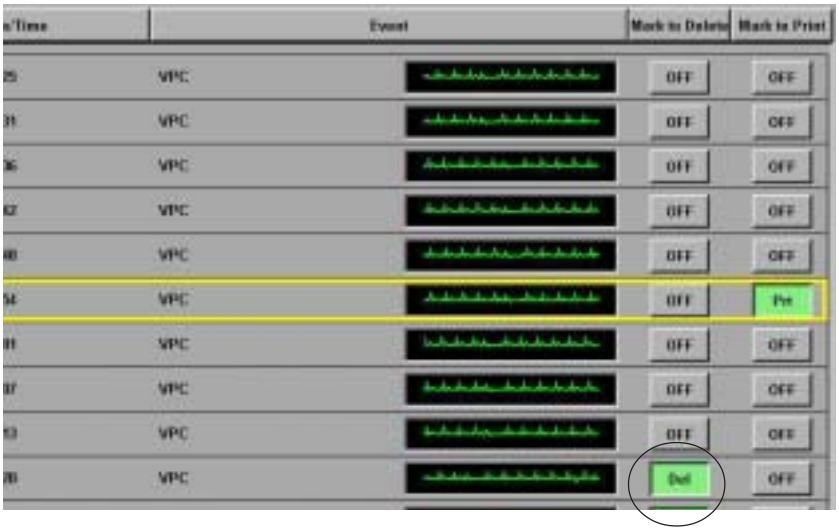
NOTE

Deletion of arrhythmia recall files can only be performed at the central monitor where the bed's data are saved. The "Delete" and "Mark to Delete" are not available (dim) on the screen of the central monitors which do not save the bed's data.

Deleting Files with Deletion Marks

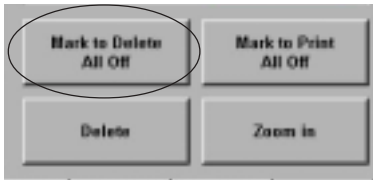
You can mark files you want to delete, then delete all the marked files together.

1. Do one of the following to add a deletion mark to files you want to delete.
   - Touch the file on the file list window. Then, under "Mark to Delete", touch "OFF" for each file you want to delete. The key changes to "Del".



   - Display the file on the expanded waveform window and touch "Mark to Delete".

2. On the file list window, touch “Delete”. A message window to confirm deletion appears.



3. Touch “Yes”. All files with a deletion mark are deleted. To cancel deletion, touch “No”.

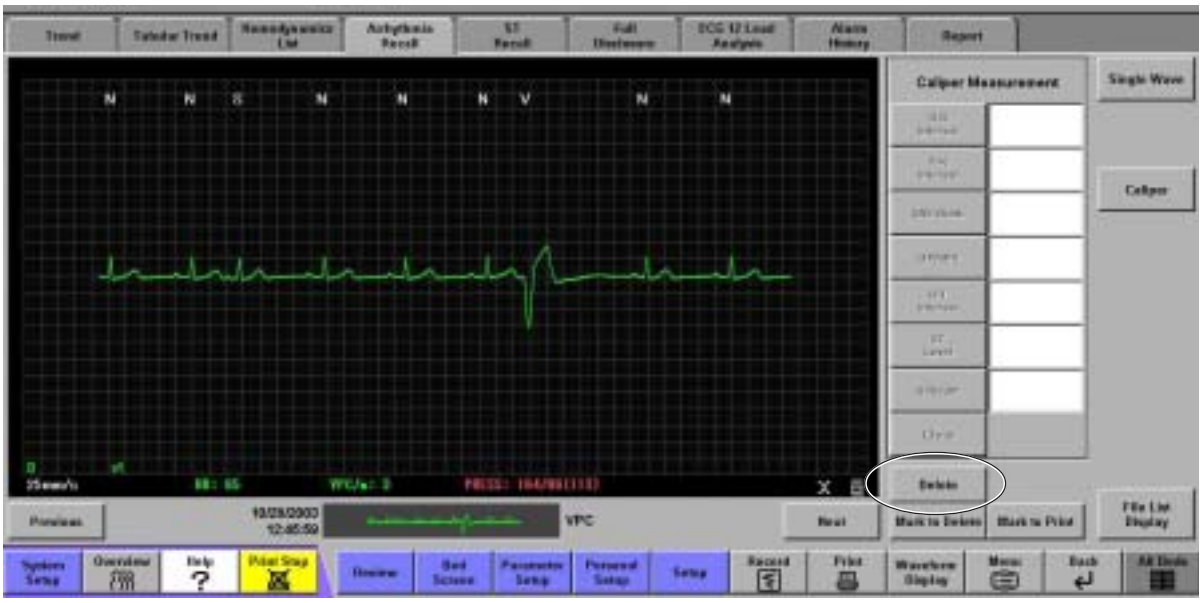
You can touch “Mark to Delete All Off” to cancel all delete marks.

Deleting the File Displayed on the Expanded Waveform Window

You can delete the file whose expanded waveform is displayed on the expanded waveform window.

1. Display the file on the expanded waveform window.

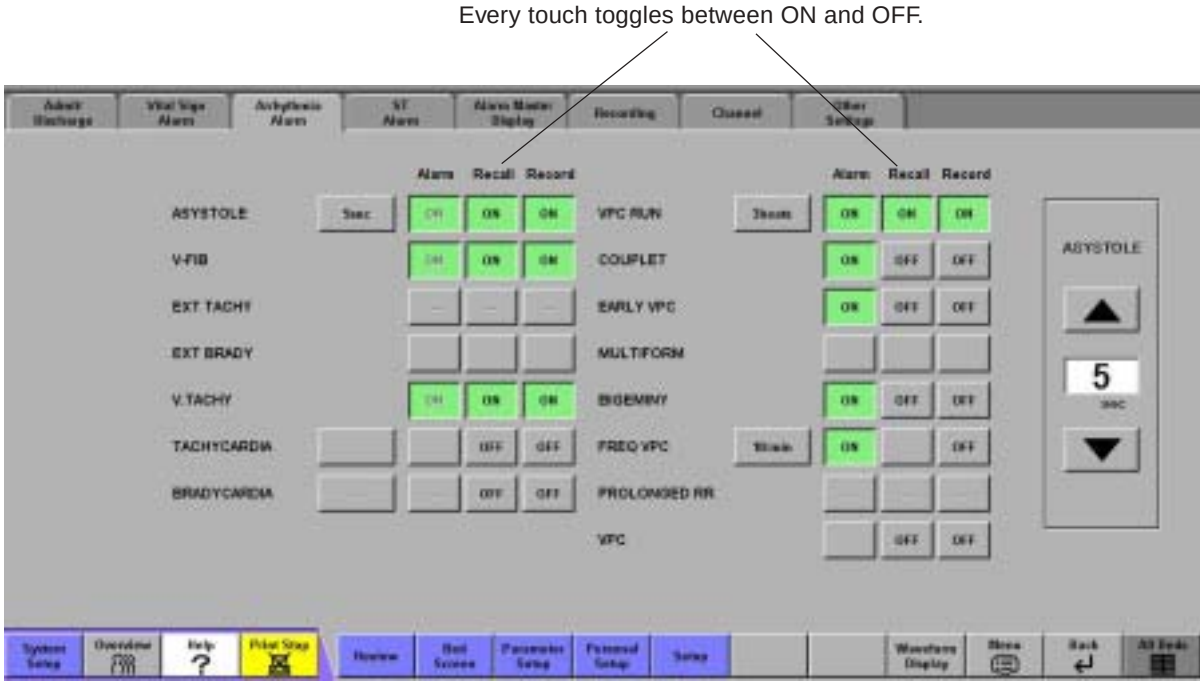
2. Touch “Delete” on the expanded waveform window. A message window to confirm deletion appears.



3. Touch “Yes”. The file displayed on the Expanded Waveform window is deleted. To cancel deletion, touch “No”.

Setting Arrhythmia Recall File Creation

You can select whether to create arrhythmia recall files individually for each arrhythmia type on the Arrhythmia Alarm window of the Personal Setup. Set "Recall" to "ON" to create recall files for the arrhythmia.



Priority of Creating Arrhythmia Recall Files

If several arrhythmias occur while creating an arrhythmia recall file, a recall file is created according to the priority shown below.

High

Message	Meaning
ASYSTOLE	Asystole
V FIB	Ventricular fibrillation
V TACHY	Ventricular tachycardia
EXT TACHY	Extreme tachycardia
EXT BRADY	Extreme bradycardia
VPC RUN	VPC short run
COUPLET	VPC couplet (Paired VPC)
MULTI FORM	Multi-form ECG
EARLY VPC	Early VPC
BIGEMINY	Ventricular bigeminy
TACHY	Tachycardia
BRADY	Bradycardia
PROLONGED RR	Prolonged R-R interval
VPC	Ventricular premature contraction

Low

Selecting the Arrhythmia Types Displayed on the File List

Select the arrhythmia types to display recall files on the file list window. Touch the arrhythmia key of the desired arrhythmia type. Every touch toggles between selected and unselected.

Touch “ALL” to select all arrhythmia types. If you touch “ALL” again, all arrhythmia types become unselected.

Recording on the Arrhythmia Recall Window

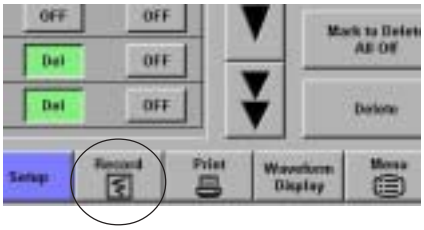
Arrhythmia Recall Recording

Recording/Printing Displayed Files

Regardless of whether a file has a printing mark, you can record or print a selected file.

<u>With the WS-971R recorder unit:</u>

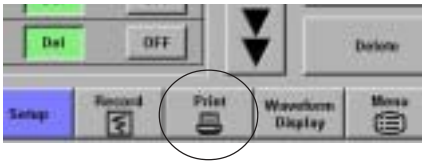
There are two ways to record.



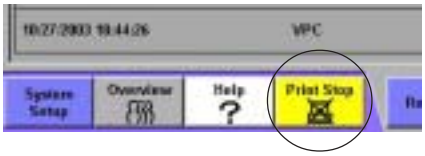
- On the file list window, touch "▲" or "▼" to select a file you want to record, and then touch "Record".
- Display the waveform you want to record on the Expanded Waveform window. To record with the WS-971R recorder unit, touch "Record". When multiple waveform display is selected, the two top waveforms are recorded.

During recording, the "Record" key changes to "REC Stop". To stop recording, touch "REC Stop".

<u>With the laser printer:</u>



Display the waveform you want to record on the Expanded Waveform window and touch "Print". When multiple waveform display is selected, all waveforms on the Expanded Waveform window are printed.

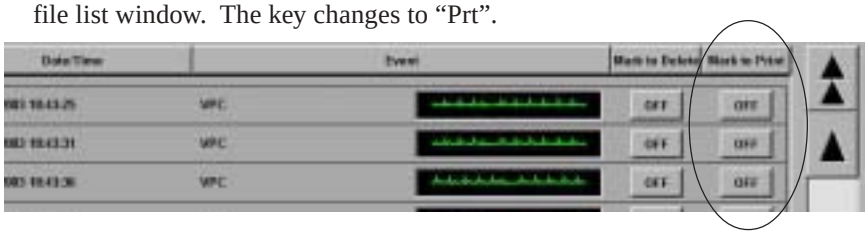


To stop printing, touch "Print Stop".

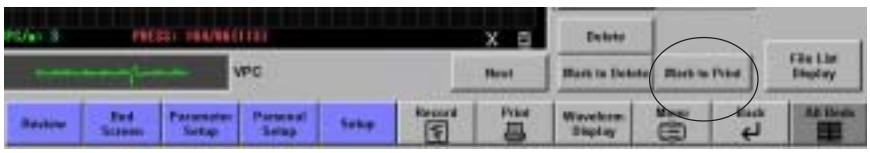
Printing Files with Printing Marks

With the laser printer you can print all the files with printing marks at the same time. Up to 12 printing marks can be set.

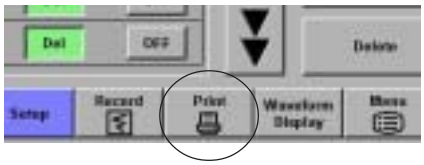
1. Add a printing mark to every file you want to print by either of the following methods.
   - Under "Mark to Print", touch "OFF" for each file you want to print on the file list window. The key changes to "Prt".



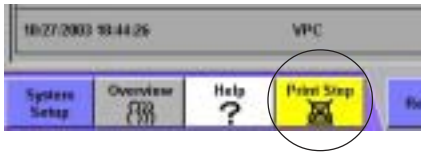
   - Display the file on the expanded waveform window and touch "Mark to Print".



Touch “Mark to Print All Off” to set all the printing marks off.



2. On the file list window, touch “Print”.

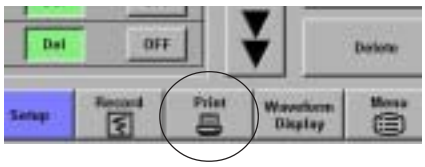


To stop printing, touch “Print Stop”.

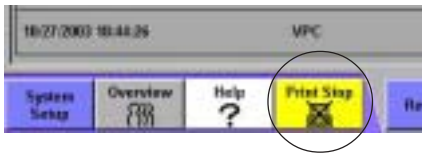
Printing Caliper Measurement Data

You can print caliper measurement results with the laser printer.

1. Do caliper measurement.



2. Touch “Print”. The displayed arrhythmia recall waveform and its caliper measurement data are printed.



To stop printing, touch “Print Stop”.

NOTE

When you use the printing marks to print many files at the same time, caliper measurement results are printed.

Other Recordings

The following recordings are also available on the Arrhythmia Recall window with the WS-971R recorder unit.

Manual Recording: Delayed recording

Automatic recording: Periodic recording, Alarm recording

Call recording

Remote delayed recording

ST Recall Window

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- Displaying the ST Recall Window 9.5.1
- Window Description 9.5.2

Viewing the ST Recall Window 9.5.3
- Scrolling the ST Recall Files 9.5.3
- Scrolling the ST Waveform 9.5.3

Changing ST Recall Window Display Settings 9.5.4
- Setting the Display Position of the ST Waveform 9.5.4
- Changing Sensitivity 9.5.5
- Setting ST Analysis Method 9.5.5
- Changing the Interval 9.5.5

Recordings on the ST Recall Window 9.5.6
- ST Recall Recording 9.5.6
  - Recording a Selected File 9.5.6
  - Printing Files 9.5.6
- Other Recordings 9.5.6

Overview

The ST Recall window displays ST recall files. ST recall files are created at every preset interval. Maximum 4320 files can be saved.

NOTE

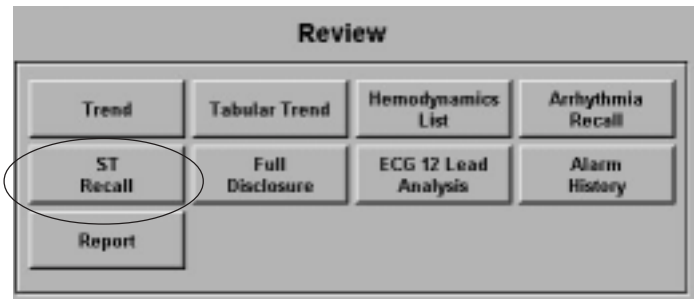
When 4320 files are already saved and another file is created, the oldest file is automatically deleted.

Displaying the ST Recall Window

1. Touch the basic information area of the bed you want to display the ST Recall window of.

2. Touch “Menu” to display the Menu screen.

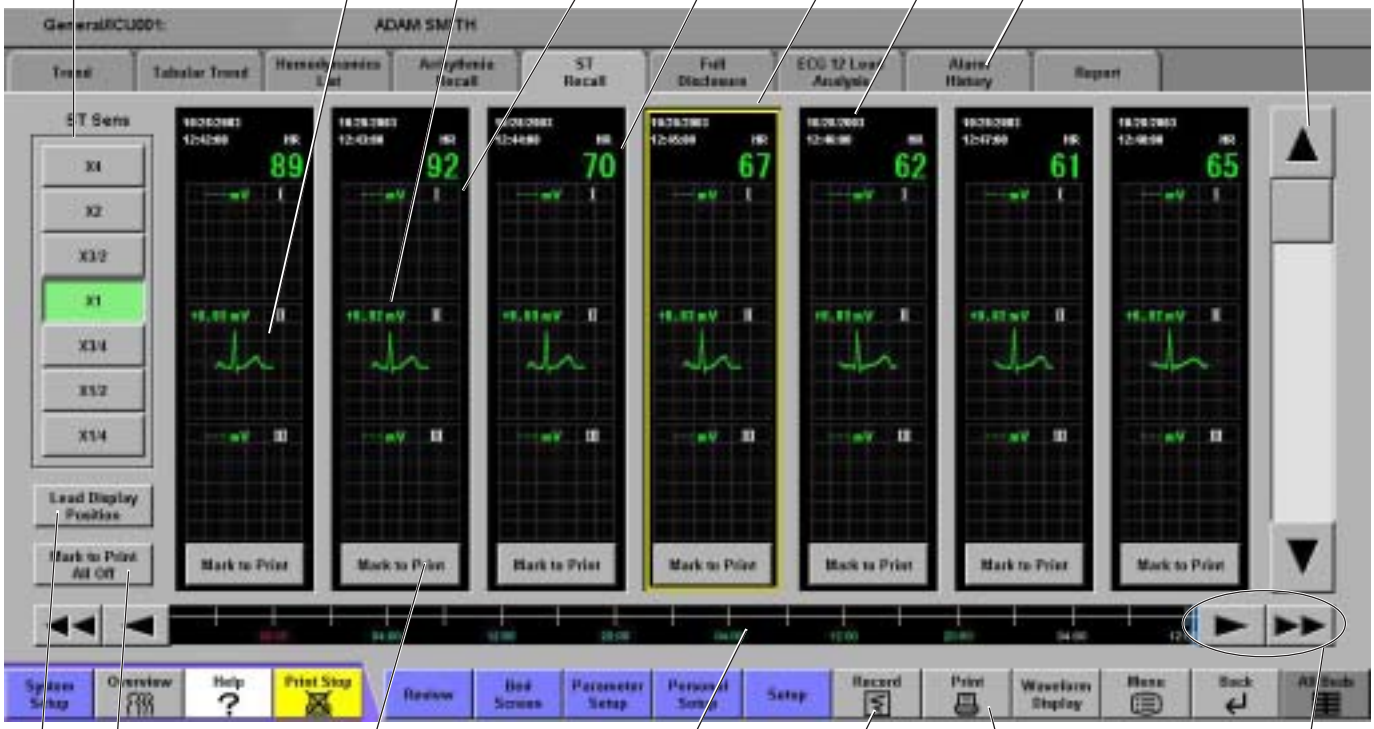
3. Touch “ST Recall” to display the ST Recall window.



Instruments that can create ST recall files are:
BSS-9800 bedside monitor
BSM-4100 series bedside monitor with software ver. 02-09 or later (for one lead)
BSM-5100 series bedside monitor (for one lead)
ORG-9200/9700 multiple patient receiver

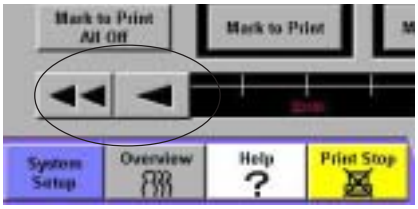
Window Description

The ST Recall window displays date and time of file storage, heart rate, ST waveform and ST value for each lead. Up to 7 files are displayed at the same time.


File stored date and time
ST recall waveform:
One waveform is about 0.6 seconds.
Waveforms up to 12 leads are saved.
Selected file:
The selected file is indicated with a highlighted border.
Touch to change to another review window.
Touch to change the ST recall waveform sensitivity.
ST value
Lead
Heart rate
Touch to scroll the ST waveforms
Printing mark
Time bar
Touch to set the all the printing marks off.
Touch to record a selected file with the WS-971R recorder unit.
Touch to print all files with a printing mark with the laser printer
Touch to set a lead of ST recall waveform.
Touch to scroll the file list

Viewing the ST Recall Window

Scrolling the ST Recall Files



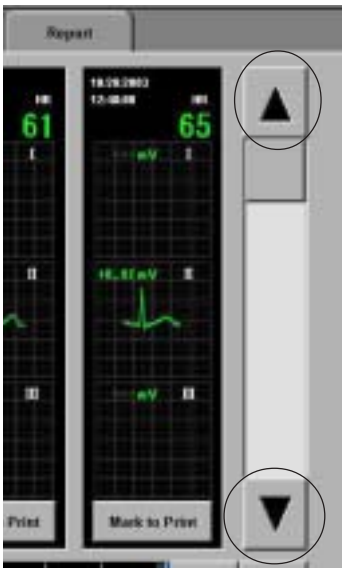
ST recall files can be scrolled left or right to display older or newer ST waveforms.
Touch the following keys to scroll the file list.

◀◀ ▶▶ : Scrolls by one page.

◀ ▶: Scrolls by one file.

You can also scroll the file list by touching the time bar.

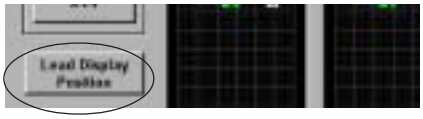
Scrolling the ST Waveform



ST waveforms of maximum 12 leads are saved per one file.
Scroll the window up or down to display other leads.
Touch ▲ or ▼ to scroll the ST waveform vertically.
6 leads are displayed on the Expand Individual Bed screen in dual display composition.

Changing ST Recall Window Display Settings

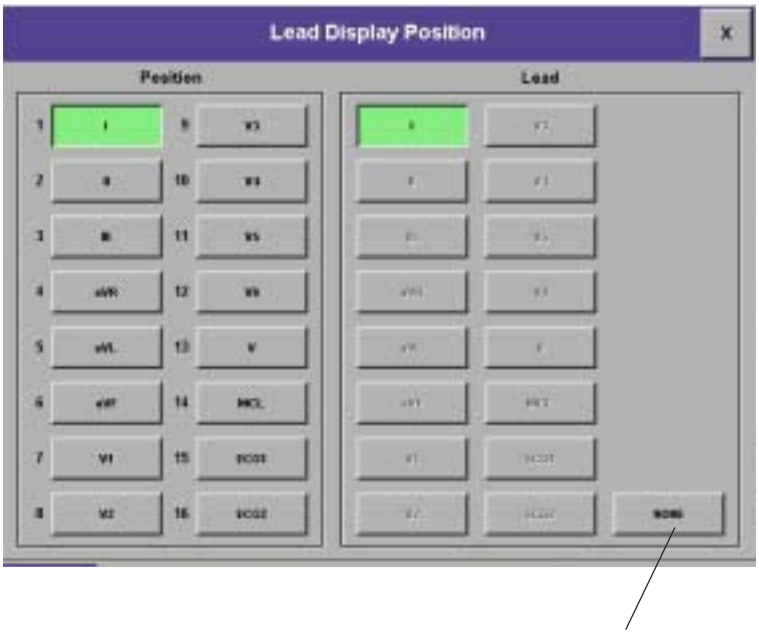
Setting the Display Position of the ST Waveform



You can set the display position of the lead of ST waveforms.

1. Touch " Lead Display Position" to display the setting window.

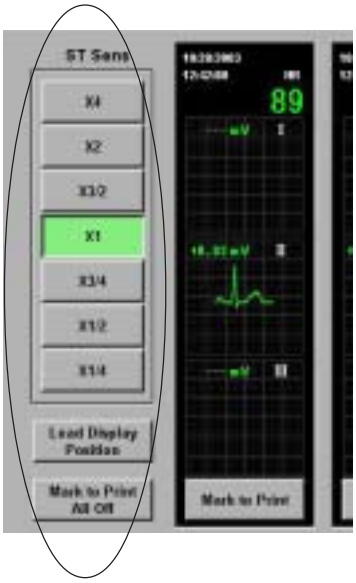
2. Select the lead by touching the desired lead key in "Position" and select the desired lead in "Lead". The lead display position is changed.



3. Touch "⊠" to close the setting window.

Changing Sensitivity

You can change the sensitivity of the displayed ST waveform. Touch in the “ST Sens” to change the sensitivity.



Setting ST Analysis Method

For the ORG-9200/9700 multiple patient receiver, you can set the ST analysis point on the ECG window of the Parameter Setup. Refer to Section 12.

Changing the Interval

For the ORG-9200/9700 multiple patient receiver, the ST recall file storage (displaying) interval can be changed on the ECG window of the Parameter Setup. Refer to Section 12. For other bedside monitors, the interval is fixed to 1 minute.

Recordings on the ST Recall Window

ST Recall Recording

Recording a Selected File

To record a file with the WS-971R recorder unit, touch the file and touch “Record”.

During recording, the “Record” key changes to “REC Stop”. To stop recording, touch “REC Stop”.

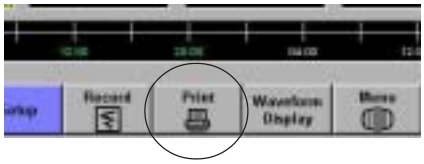
Printing Files

To print files with the laser printer:

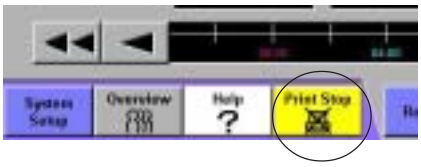
NOTE

Up to 24 printing marks can be set.

1. Touch “Mark to Print” on all files you want to print. A printing mark appears at each selected file.



2. Touch “Print”. All marked files are printed.



To stop printing, touch “Print Stop”.

Other Recordings

The following recordings are also available on the ST Recall window with the WS-971R recorder unit.

Manual Recording: Delayed recording
Automatic recording: Periodic recording, Alarm recording
Call recording
Remote delayed recording

Full Disclosure Window

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  - Compressed Waveform Display 9.6.2
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  - Triangle Waveform 9.6.4

Viewing the Full Disclosure Window 9.6.5
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- Measuring an Full Disclosure Waveform with the Calipers 9.6.7
  - Changing Display Zoom and Sweep Speed 9.6.8
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- Full Disclosure Waveform Printing 9.6.12
- Recording/Printing Expanded Waveform 9.6.12
- Printing Caliper Measurement Data 9.6.13
- Other Recordings 9.6.13

Overview

NOTE

- **The Full Disclosure window is only available when the QP-973P Full Disclosure Filing Program Kit is installed.**
- **When you open the Full Disclosure window from another review window, the full disclosure data of the time that was displayed on the previous review window is displayed.**

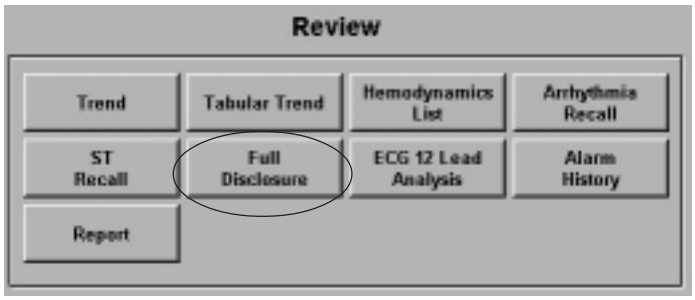
The central monitor saves up to 72 hours of full disclosure waveform data for up to six waveforms and displays them on the Full Disclosure window.

Displaying the Full Disclosure Screen

1. Touch the basic information area of the bed you want to display the Full Disclosure window for.

2. Touch “Menu” to display the Menu screen.

3. Touch “Full Disclosure” to display the Full Disclosure window.

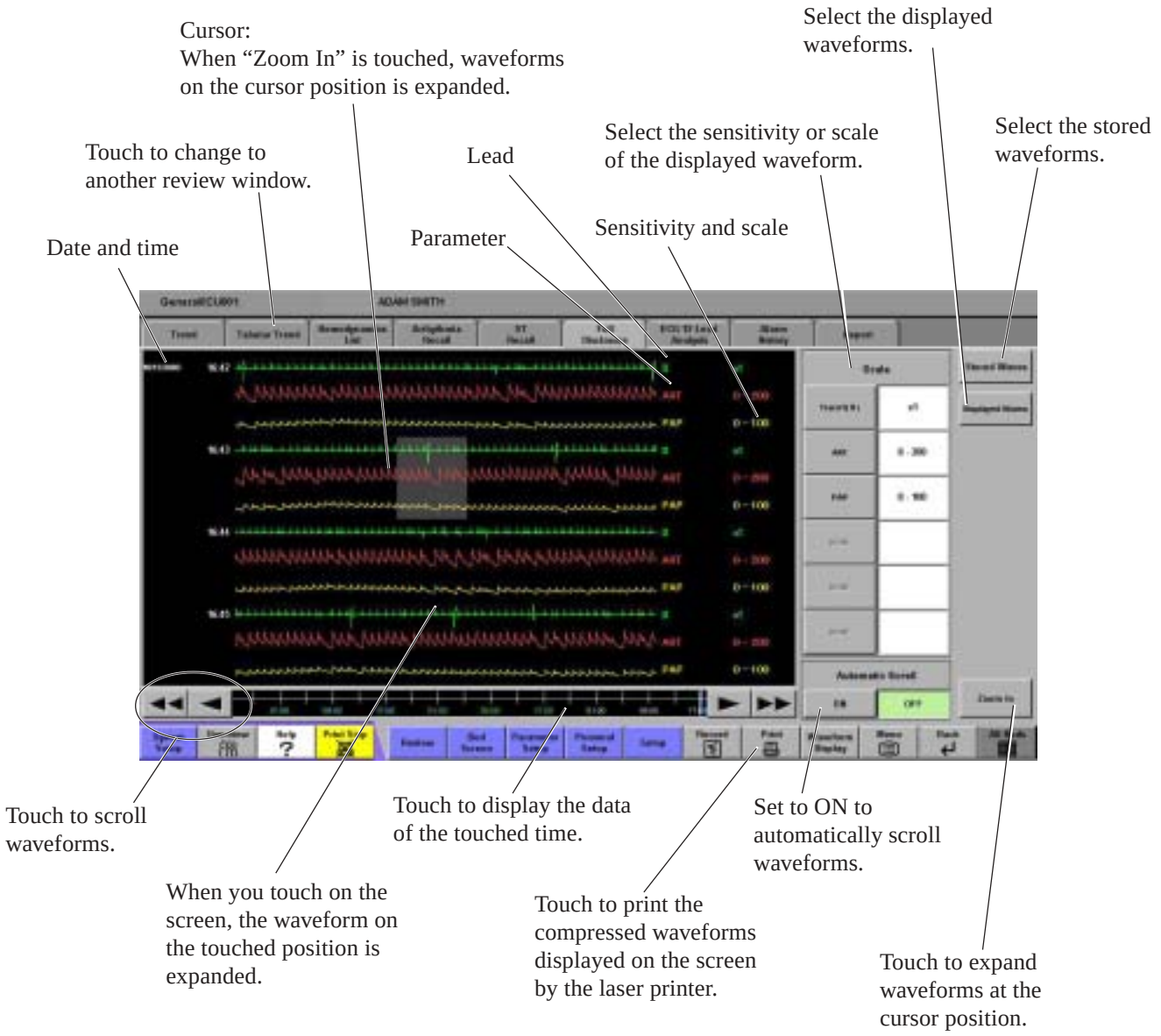


Window Description

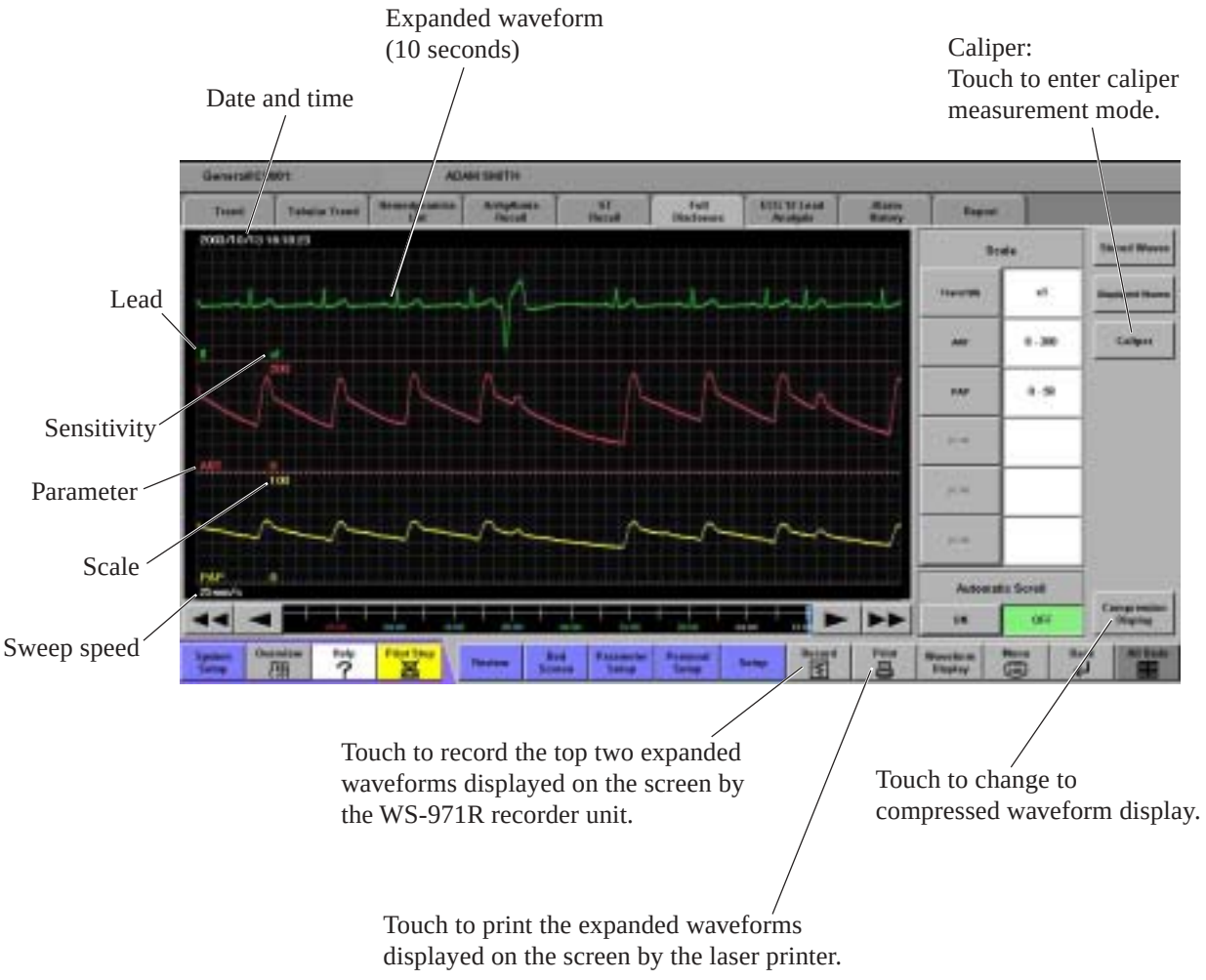
The Full Disclosure window displays up to 72 hours of full disclosure waveform data for up to six waveforms. When one full disclosure waveform is displayed, the waveform is for 12 minutes of data. The displayed time length depends on the number of displayed waveforms. You can expand any part of the full disclosure waveform into the actual size.

When one full disclosure waveform is displayed, the waveform is for 30 minutes of data on the Expand Individual Bed screen in dual display composition.

Compressed Waveform Display


Cursor:
When "Zoom In" is touched, waveforms on the cursor position is expanded.
Select the displayed waveforms.
Touch to change to another review window.
Lead
Select the sensitivity or scale of the displayed waveform.
Select the stored waveforms.
Date and time
Parameter
Sensitivity and scale
Touch to scroll waveforms.
When you touch on the screen, the waveform on the touched position is expanded.
Touch to display the data of the touched time.
Touch to print the compressed waveforms displayed on the screen by the laser printer.
Set to ON to automatically scroll waveforms.
Touch to expand waveforms at the cursor position.

Expanded Waveform Display
(Actual Size Display)



Stored Waveforms and Displayed Waveforms

- Stored waveforms are the waveforms to be saved as full disclosure data. You can select up to 6 types of waveforms from all of the currently measured waveforms and parameters which are set up on the Parameters window. You can select stored waveforms only at the central monitor where the bed's data is saved.
- Displayed waveforms are the waveforms to be displayed on the Full Disclosure window. Select maximum 6 types of waveforms from stored waveforms.
- If you change stored waveform setting during monitoring, selectable display waveforms also changes.

Display Color

When an arrhythmia alarm is not generating, the full disclosure waveform is displayed in the color selected for each type of waveform at the Parameter Colors window of the System Setup. However, when an arrhythmia alarm is generated, the ECG waveforms are displayed in the corresponding arrhythmia alarm color as specified in the table below.

Arrhythmia Alarm	ECG Waveform Color
ASYSTOLE V.FIB EXT. TACHY EXT. BRADY V.TACHY	Red
TACHYCARDIA BRADYCARDIA	Orange
VPC RUN COUPLET EARLY VPC MULTIFORM BIGEMINY FREQ VPC PROLONGED RR VPC	Yellow

NOTE

When arrhythmia analysis is set to OFF, the display color does not change.

Triangle Waveform

Triangle waves are displayed in the following situations.

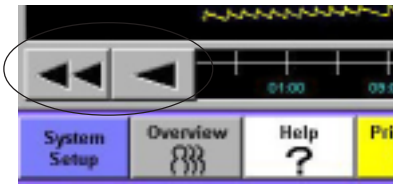
- No communication between the central monitor and bedside monitor. (The bedside monitor is turned off, or the bedside monitor is not connected to the central monitor.)
- Signal loss
- Electrodes off / The parameter is not measured.
- Before the patient is admitted.
- During temporary discharge
- The waveform was not selected as a storage waveform.

Viewing the Full Disclosure Window

CAUTION

When the full disclosure waveform is expanded to actual size, it may be distorted because it has been compressed then expanded. When reading the expanded ECG waveforms, be aware of this distortion.

Scrolling the Full Disclosure Waveform



Touch the following keys to scroll the waveform.

◀◀ ▶▶ : Scrolls by one page.

◀ ▶: Scrolls by two seconds*

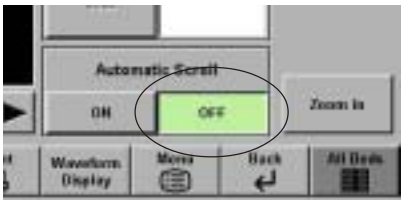
*For the actual size waveform, scrolls by one second.

You can also scroll the waveform by touching the time bar.

Automatic Scroll

This function scrolls by one page every three seconds.

1. Touch “ON” at “Automatic Scroll” to activate the automatic scroll function.
2. Touch ◀◀ or ▶▶ to start scrolling.



3. When the desired waveform appears on the window, touch “OFF” at “Automatic Scroll” to stop scrolling.

NOTE

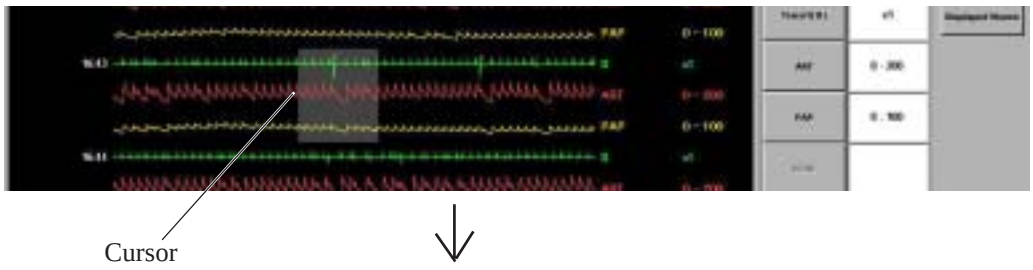
- **If you do any key operation other than touching ◀◀ or ▶▶ while automatic scroll function is ON, the function automatically turns to OFF.**
- **When you scroll up to the oldest or newest data, scroll automatically stops.**

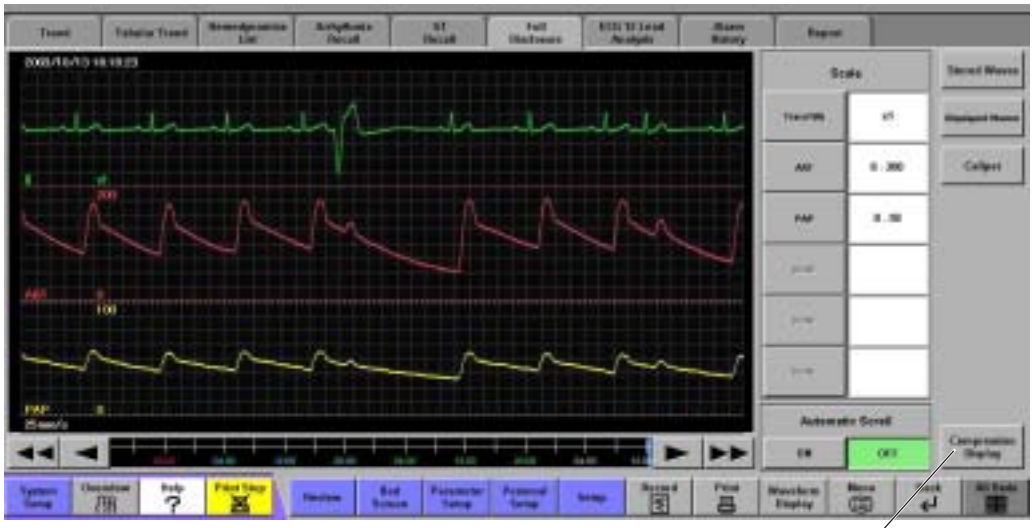
Expanding the Full Disclosure Waveform into Actual Size

10 second segments of the full disclosure waveforms at the position indicated by the cursor are expanded and redrawn on a grid background.

To expand the waveform:

- Touch the full disclosure waveform where you want to expand. The cursor moves to the touched point and the expanded waveform appears on the grid background.





Or,

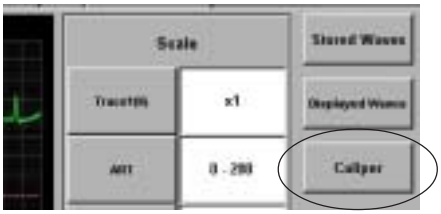
- If you touch “Zoom in”, the waveform at the cursor is expanded.

Measuring an Full Disclosure Waveform with the Calipers

NOTE

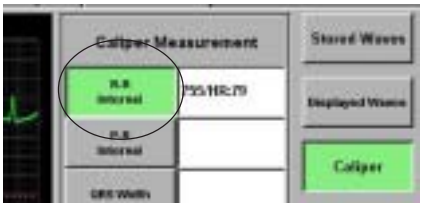
Caliper measurement results are saved only when measuring on a central monitor where the bed's data is saved. When measuring on a central monitor where the bed's data is not saved, the "Caliper information is not saved" message appears on the screen.

On the expanded waveform window, you can measure the distance between any two points on full disclosure waveform.



1. Expand any part of the full disclosure waveform.

2. Touch "Caliper".



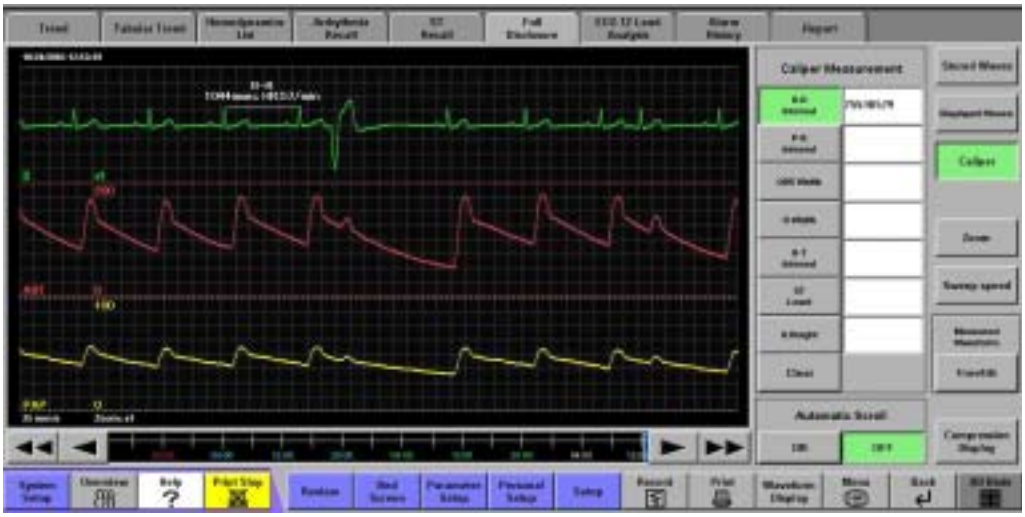
3. Touch the key of a measurement item you want to measure.

Item	Direction	Unit	Measured waveform
R-R (HR is also displayed)	Horizontal	R-R: sec HR: /min	All waveforms
P-R		msec	ECG
QRS-WIDTH			
Q-WIDTH			
Q-T			
ST	Vertical	mV	
Q-HEIGHT			

4. Touch any two points on the waveform. A line appears between two points and the vertical or horizontal distance of the two points is displayed. To continuously measure another distance, touch any two points on the waveform. The previous measurement result disappears and the new measurement result is displayed.

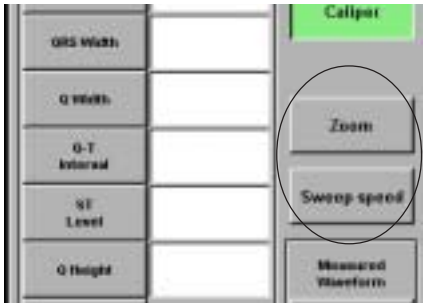
NOTE

- **The line and measurement result on the waveform window disappear when you exit the caliper measurement mode.**
- **If you change the following settings during caliper measurement, the line and measured value on the waveform window are deleted.**
  - **Display zoom**
  - **Sweep speed**
  - **Measured Waveform**



Changing Display Zoom and Sweep Speed

On the caliper measurement window, you can change display zoom and sweep speed.



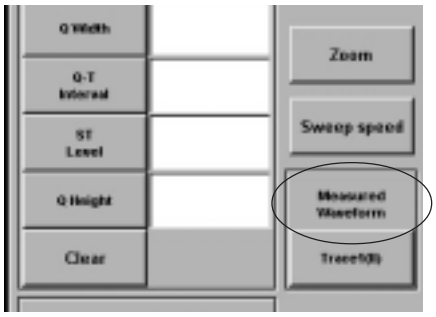
Zoom: ×1, ×2, ×4

Sweep speed: 25 mm/sec, 50 mm/sec

1. Touch “Zoom” or “Sweep speed” to open the setting window.
2. Touch the desired value.
3. Touch “⊠” to close the setting window.

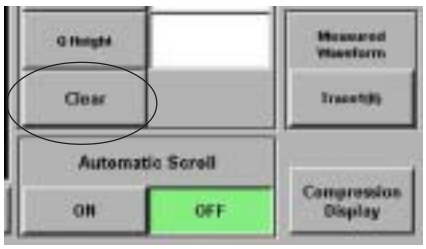
Selecting the Measured Waveform

Select either waveform to be measured.



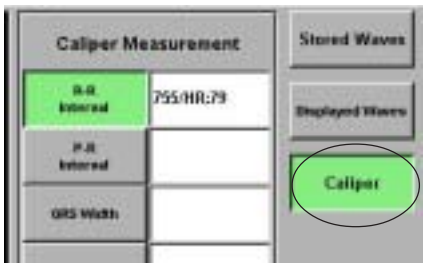
1. Touch the key at “Measured Waveform” to open the Select Meas. Waveform window.
2. Touch the key of the waveform you want to measure.
3. Touch “⊠” to close the window.

Deleting All Measurement Results



Touch “Clear” to delete all measurement results.

Ending Caliper Measurement



Touch “Caliper” to end caliper measurement. Measured values remain on the screen and saved unless they are deleted.

NOTE

Caliper measurement results are saved only when measuring on a central monitor where the bed’s data is saved. When measuring on a central monitor where the bed’s data is not saved, the “Caliper information is not saved” message appears on the screen.

Waveform Storage Setup

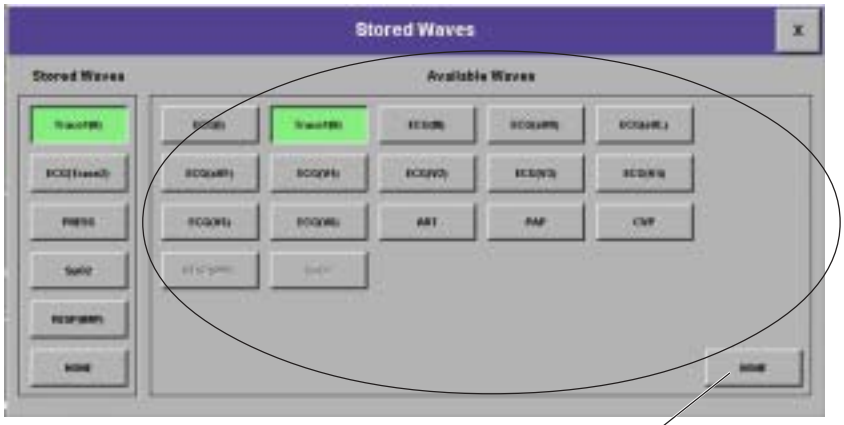
NOTE

This setting is only available at the central monitor where the bed's data is stored.

You can select which waveforms will be stored in the full disclosure file. Only the currently measured waveforms and the waveforms set up on the Parameter window can be selected. You can select up to 6 waveforms.

1. Touch "Stored Waves" to display the Stored Waves window.

2. After you select a key at "Stored Waves", touch the key of waveform you want to store from the options displayed at "Available Waves".



Touch NONE to unselect all items

In the options, currently measured waveforms are displayed. To select a waveform that is not currently measured, first register the parameter at the Parameters window of the System Setup.

3. Touch "⊠" to close the window.

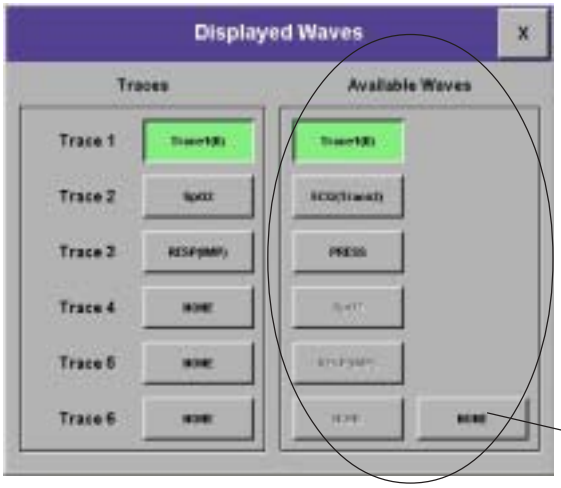
Changing the Full Disclosure Window Display

Changing the Displayed Waveforms

Select the waveforms to be displayed on the Full Disclosure window from the stored waveforms.

1. Touch “Displayed Waves” to open the setting window.

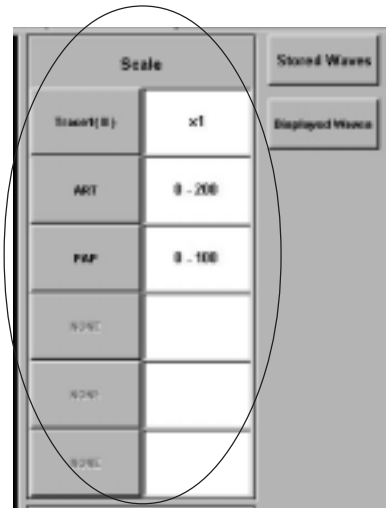
2. After you select the key in “Traces”, touch the key of a waveform you want to display.



Touch NONE to unselect all items

3. Touch “⊠” to close the window.

Changing the Sensitivity and Scale



You can select sensitivity and scale both for compressed waveform display and expanded waveform display.

1. Touch the item you want to change the sensitivity or scale. The setting window opens.

2. Touch the desired value. The changed sensitivity and scale settings take effect at this moment.

3. Touch "⊠" to close the window.

Recordings on the Full Disclosure Window

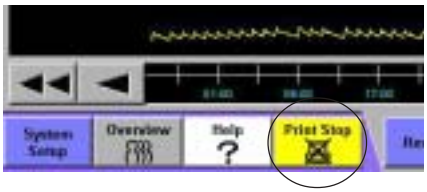
Full Disclosure Waveform Printing

With the laser printer, you can print the full disclosure waveform displayed on the window.

The printed time length of a compressed waveform depends on the number of waveforms displayed on the screen. The printed waveform is from the currently displayed time to the past.

No. of displayed waveforms	Length of printed waveform
1 waveform	30 minutes
2 waveforms	15 minutes
3 waveforms	10 minutes
4 waveforms	7 minutes
5 waveforms	6 minutes
6 waveforms	5 minutes

To print, touch “Print” on the Full Disclosure window.

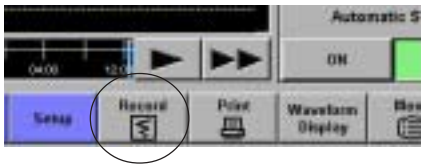


To cancel printing during printing, touch “Print Stop”.

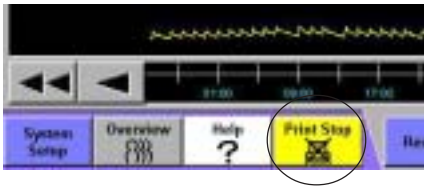
Recording/Printing Expanded Waveform

You can record or print the expanded waveform on the window.

With the WS-971R recorder unit:



Touch “Record” on the expanded waveform window. When three or more waveforms are on the window, the two top waveforms are recorded.



During recording, the “Record” key changes to “REC Stop”. To stop recording, touch “REC Stop”.

With the laser printer

The printed time length of a compressed waveform depends on the number of waveforms displayed on the screen.

No. of displayed waveforms	Length of printed waveform
1 waveform	40 seconds
2 waveforms	20 seconds
more than 3 waveforms	10 seconds

To print with the laser printer, touch “Print”. When several waveforms are on the window, all of them are printed.

To cancel printing during printing, touch “Print Stop”.

Printing Caliper Measurement Data

You can print the caliper measurement data with the laser printer.

1. Do caliper measurement.

2. Touch “Print”. The expanded waveform and caliper measurement data are printed with the laser printer.

To cancel printing during printing, touch “Print Stop”.

Other Recordings

The following recordings are also available on the Full Disclosure window with the WS-971R recorder unit.
Manual Recording: Delayed recording
Automatic recording: Periodic recording, Alarm recording
Call recording
Remote delayed recording

ECG 12 Lead Window

Overview 9.7.1
- Displaying the ECG 12 Lead Analysis Window 9.7.1
- Window Description 9.7.2
  - Tabular Trend Display 9.7.2
  - Zoom In Display 9.7.3
  - Comparison Display 9.7.3
  - Analysis Report Display 9.7.4

Viewing the ECG 12 Lead Analysis Window 9.7.5
- Changing the Display Types 9.7.5
  - Tabular Trend Display 9.7.5
  - Zoom In Display 9.7.5
  - Comparison Display 9.7.5
  - Analysis Report Display 9.7.6
- Scrolling the Files in the Measurement Value Table 9.7.6
- Selecting the Displayed File 9.7.6
- Selecting the Control File 9.7.6
- Switching Displayed Waveform Types 9.7.7

Deleting ECG 12 Lead Analysis Files 9.7.8
- Automatic Deletion 9.7.8
- Deleting Unnecessary ECG 12 Lead Analysis Files 9.7.8

Recordings on the ECG 12 Lead Analysis Window 9.7.9
- Other Recordings 9.7.9

Overview

NOTE

This window is only available when the QP-974P 12 Lead ECG Interpretation Filing Program Kit is installed.

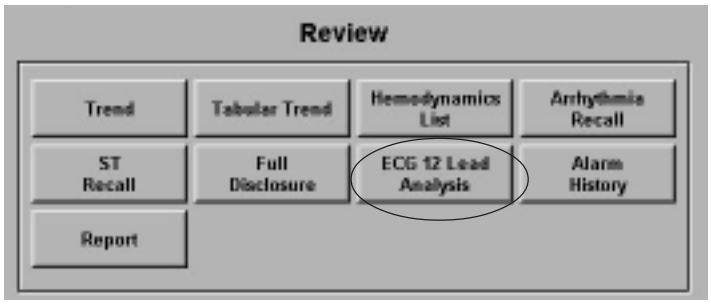
The ECG 12 Lead Analysis window displays the results of ECG 12 lead analysis performed at bedside monitors. Up to 64 files can be saved for each bed at the central monitor.

Displaying the ECG 12 Lead Analysis Window

1. Touch the basic information area of the bed you want to display the ECG 12 Lead Analysis window of.

2. Touch “Menu” to display the Menu screen.

3. Touch “ECG 12 Lead Analysis” to display the ECG 12 Lead Analysis window.



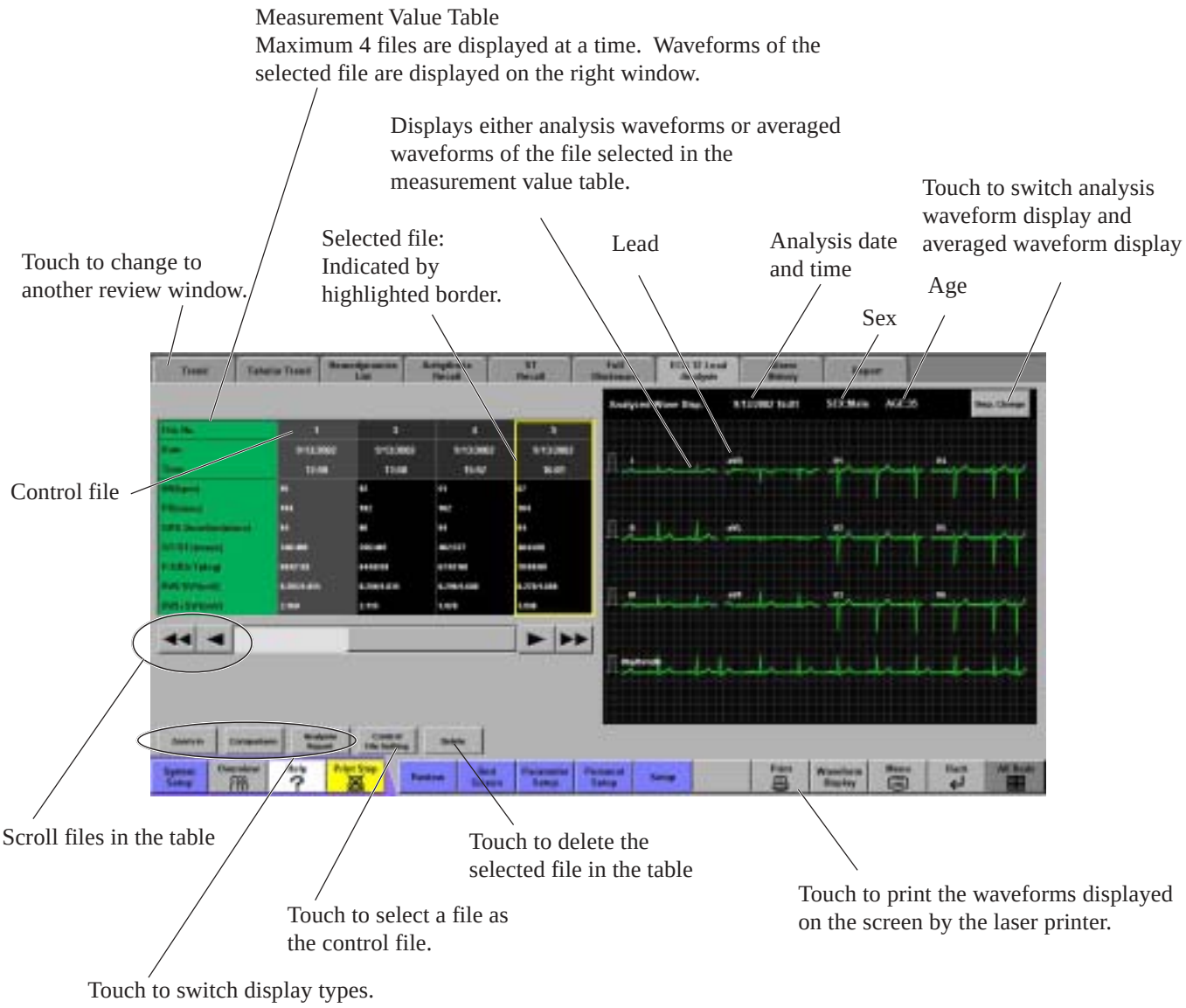
Bedside monitors that can send ECG 12 lead analysis results are:
BSM-5100 series bedside monitor
BSM-4100 series bedside monitor (software version 03-02 or later)

Window Description

The results of ECG 12 lead analysis performed at bedside monitors are displayed. The ECG 12 Lead Analysis window has four display types.

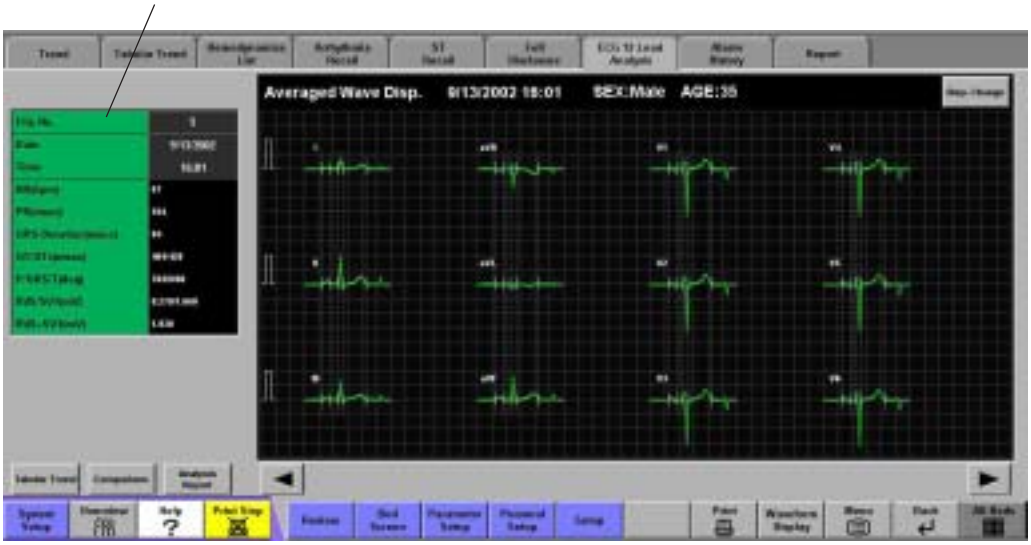
The display format for the Expand Individual Bed screen is different in dual display composition. Refer to “Viewing the ECG 12 Lead Analysis Window” in this section.

Tabular Trend Display

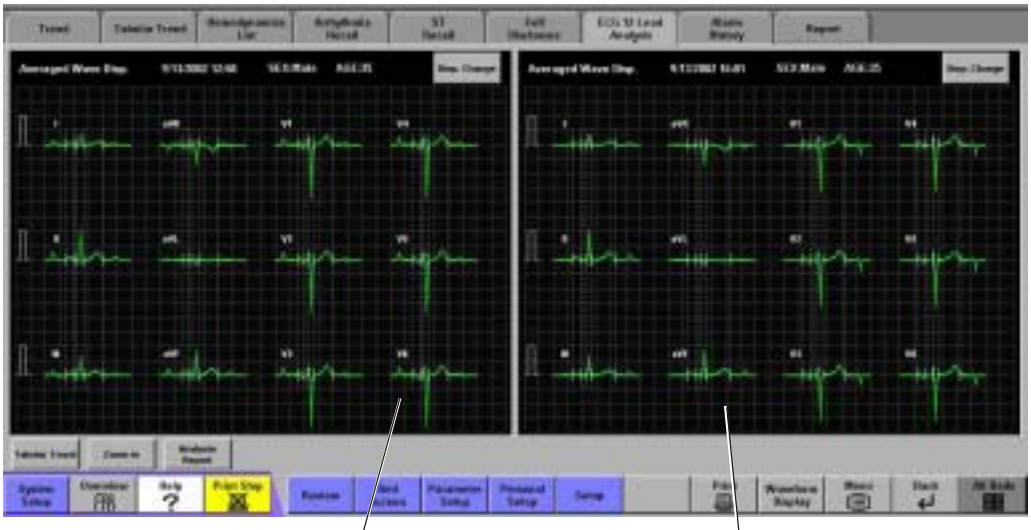

Measurement Value Table
Maximum 4 files are displayed at a time. Waveforms of the selected file are displayed on the right window.
Displays either analysis waveforms or averaged waveforms of the file selected in the measurement value table.
Touch to switch analysis waveform display and averaged waveform display
Touch to change to another review window.
Selected file: Indicated by highlighted border.
Lead
Analysis date and time
Age
Sex
Control file
Scroll files in the table
Touch to delete the selected file in the table
Touch to print the waveforms displayed on the screen by the laser printer.
Touch to select a file as the control file.
Touch to switch display types.

Zoom In Display

Measurement Value Table:
Displays the measurement values of the file whose waveform is currently displayed on the right window.



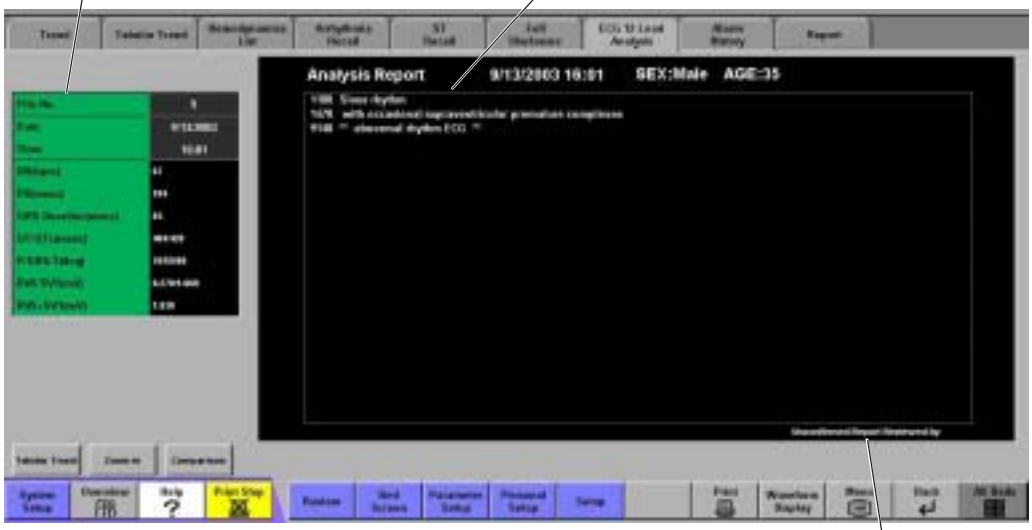
Comparison Display



Analysis Report Display

Measurement Value Table:
Displays the measurement values of the file whose report is currently displayed on the right window.

Findings



Signature of the physician who reviewed the analysis report is necessary.

Viewing the ECG 12 Lead Analysis Window

NOTE

For details about the analysis and the clinical findings, refer to the ECAPS 12C program user's guide.

Changing the Display Types

Touch the key of the desired display type.
On the regular screen, you can switch to any display type from any display type.

On the Expand Individual Bed screen in the dual display composition, the Tabular Trend display and Analysis Report display are always displayed. You can select to switch only between Zoom In display and Comparison display.

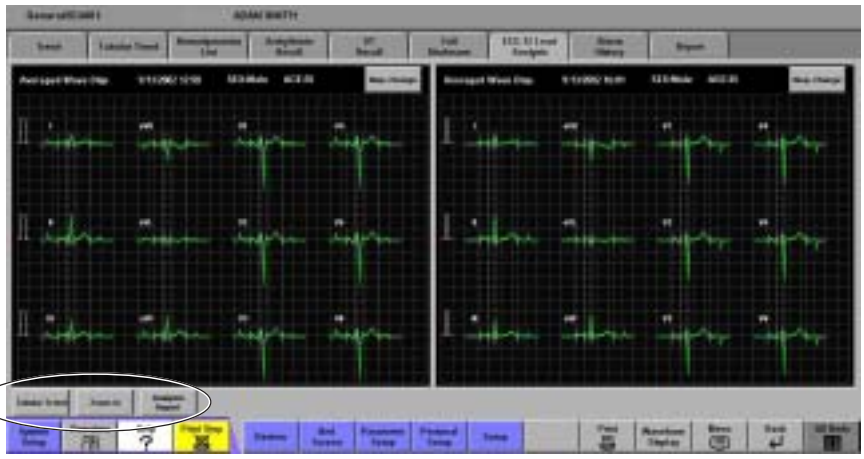
Tabular Trend Display

Touch the key of the desired display type.

Zoom In Display

Touch the key of the desired display type.

Comparison Display



Touch the key of the desired display type.

Analysis Report Display

Touch the key of the desired display type.

Scrolling the Files in the Measurement Value Table

Touch the following keys to scroll files on the measurement value table. By touching the scroll bar, you can jump to the desired file at that time range.

◀◀ ▶▶ : Scrolls by one page.

◀ ▶: Scrolls by one file.

Selecting the Displayed File

Touch a file on the measurement value table.

Selecting the Control File

A control file is a file that is used as the standard when you compare two analysis results on the Comparison display. The control file is displayed on the left window on the Comparison display.

To select a control file,

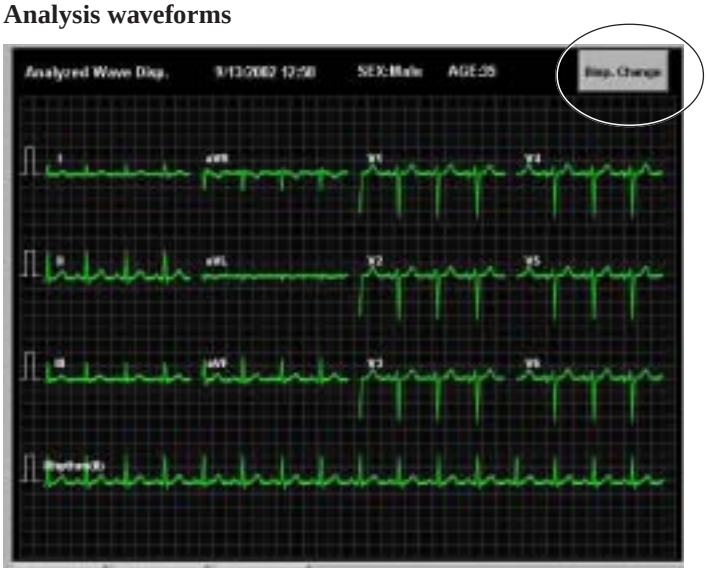
1. Touch the desired file on the measurement value table.

2. Touch “Control File Setting”. The selected file becomes the control file.

Switching Displayed Waveform Types

You can select whether to display analysis waveforms or averaged waveforms on the Tabular Trend display, Zoom In display and Comparison display. Every touch of “Disp. Change” toggles between two types.

Analysis waveforms



Averaged waveforms

Deleting ECG 12 Lead Analysis Files

Automatic Deletion

Up to 64 files can be saved for each bed at the central monitor. When there are already 64 files saved and a new file is created at the bedside monitor, the oldest file is automatically deleted at the central monitor.

Deleting Unnecessary ECG 12 Lead Analysis Files

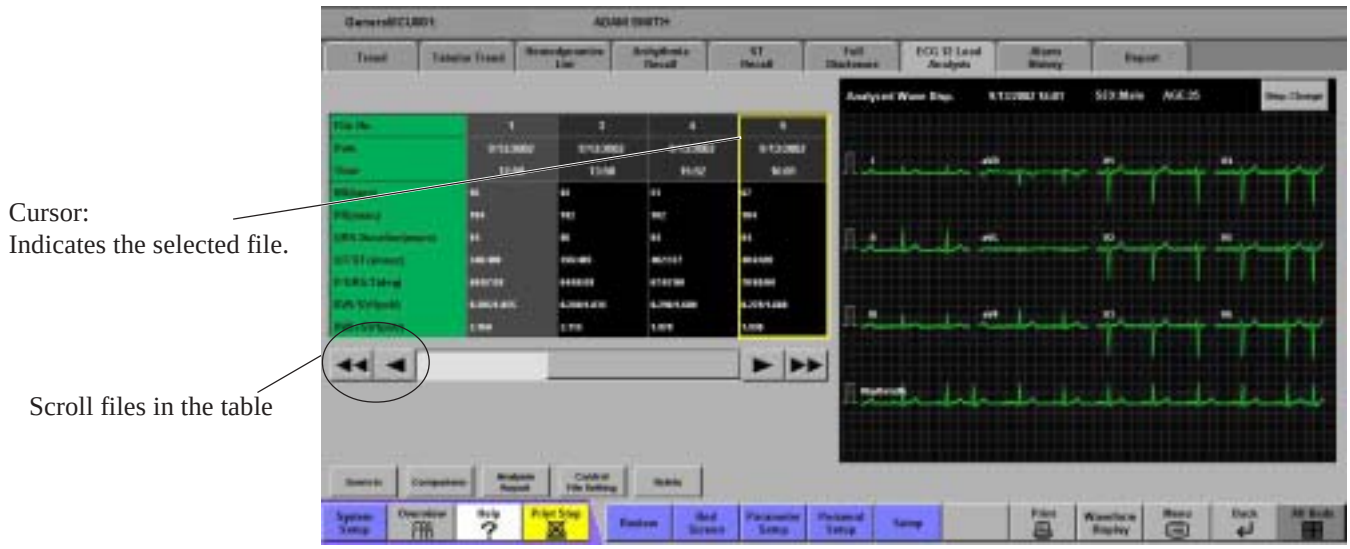
You can select and delete unnecessary ECG 12 lead analysis files.

NOTE

Deletion of ECG 12 lead analysis files can only be performed at the central monitor where the bed's data are saved. The "Delete" key is not available (dim) on the screen of the central monitors which do not save the bed's data.

1. Change the display type to Tabular Trend display.

2. Touch the file you want to delete in the measurement value table.



3. Touch "Delete". A confirmation window to delete the file opens.

4. Touch "Yes" to delete the selected file. To cancel deletion, touch "No".

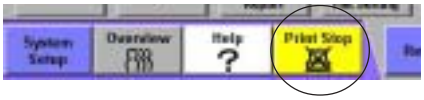
Recordings on the ECG 12 Lead Analysis Window

You can print the displayed ECG 12 lead analysis result with the laser printer. Printed items are different depending on the display types.

Display Format		Print Format	
		Regular Screen	Expand Indiv. Bed Screen
Tabular Trend Display	Analysis waveforms	Analysis waveforms	---
	Averaged waveforms	Report + Averaged waveforms	
Zoom In Display	Analysis waveforms	Analysis waveform	
	Averaged waveforms	Report + Averaged waveforms	
Comparison	---	Cannot be printed	
Analysis Report	---	Report + Analysis waveforms	---
Touch “Print” on the Expand Individual Bed screen	---	---	Report + Analysis waveforms

1. Change display types and waveform types (analysis waveforms or averaged waveforms) to the desired type.

2. Touch “Print”.



To stop printing, touch “Print Stop”.

Other Recordings

The following recordings are also available on the ECG 12 Lead Analysis window with the WS-971R recorder unit.

Manual Recording: Delayed recording

Automatic recording: Periodic recording, Alarm recording

Call recording

Remote delayed recording

Alarm History Window

Overview 9.8.1
Displaying the Alarm History Window 9.8.1
Window Description 9.8.2
Viewing the Alarm History Window 9.8.3
Scrolling the Alarm History Files 9.8.3
Sorting the List 9.8.3
Selecting the Alarm Levels and Types Displayed on the File List 9.8.4
Recordings on the Alarm History Window 9.8.5
Alarm History Recording 9.8.5
Recording a Selected File 9.8.5
Other Recordings 9.8.5

Overview

The lists of all alarms such as arrhythmia alarm, vital sign alarm, ST alarm and technical alarm on monitored beds are displayed on the Alarm History window. The most recent 1000 files can be saved for each bed.

NOTE

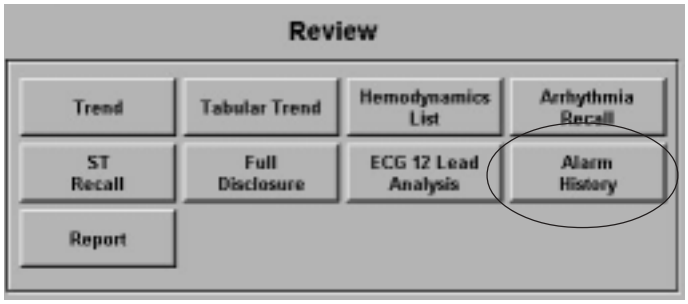
- **When more than 1000 files are created for the patient, the oldest file of the patient is automatically deleted to create new files.**
- **Alarm History window is only available at the central monitor where the bed's data is saved.**

Displaying the Alarm History Window

1. Touch the basic information area of the bed you want to display the Alarm History window of.

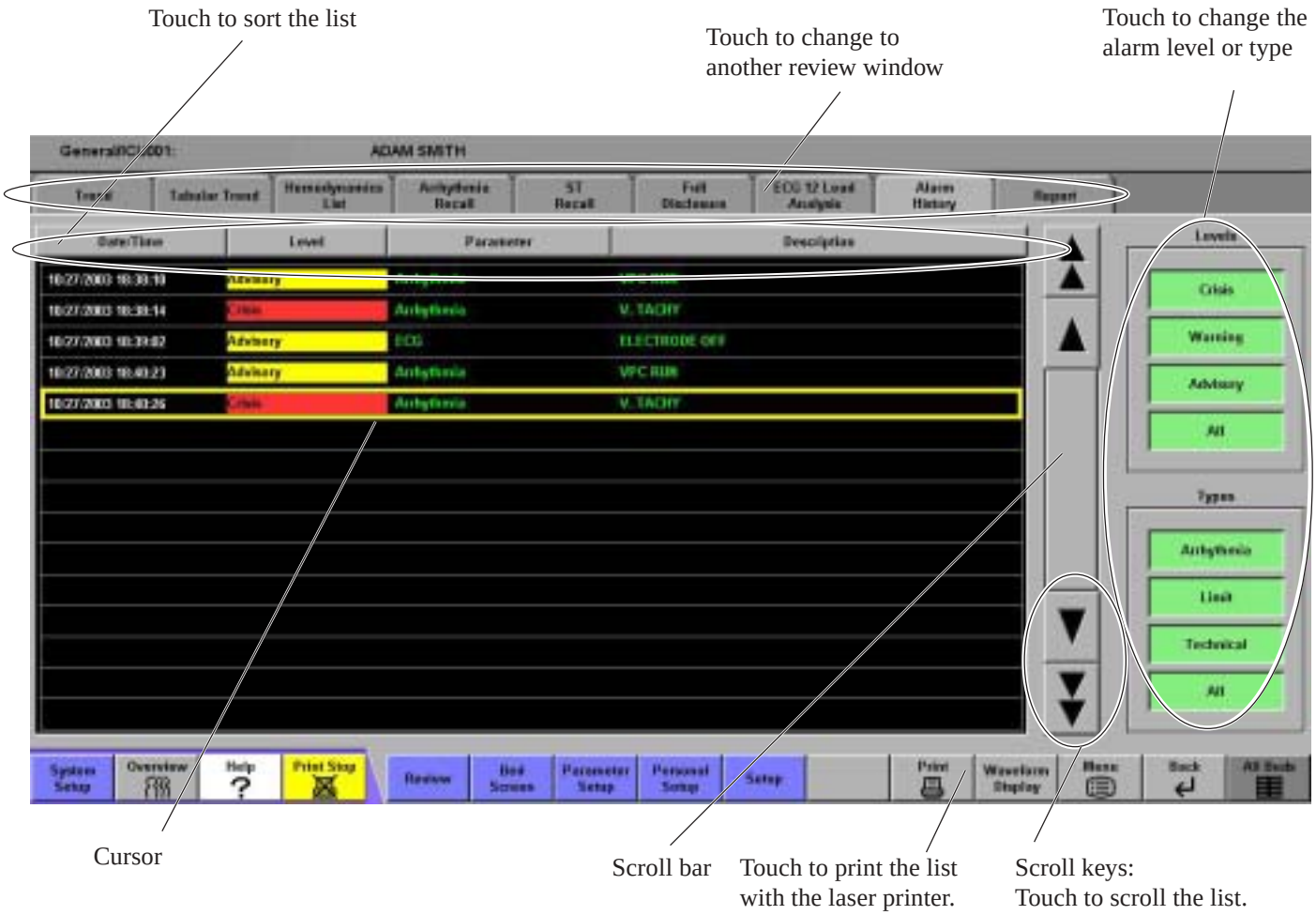
2. Touch "Menu" to display the Menu screen.

3. Touch "Alarm History" to display the Alarm History window.



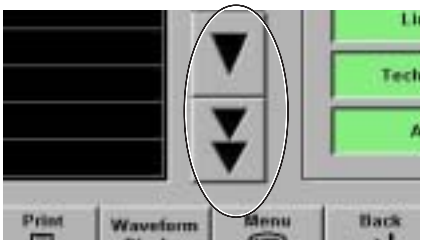
Window Description

The Alarm History window displays file lists such as report creation date and time, alarm levels, parameters and descriptions.
You can switch the file list by alarm levels and alarm types.


Touch to sort the list
Touch to change to another review window
Touch to change the alarm level or type
Cursor
Scroll bar
Touch to print the list with the laser printer.
Scroll keys: Touch to scroll the list.

Viewing the Alarm History Window

Scrolling the Alarm History Files



Touch the following keys to scroll the file.

▲ ▼ : Scrolls by one page.

▲ ▼: Scrolls by one file.

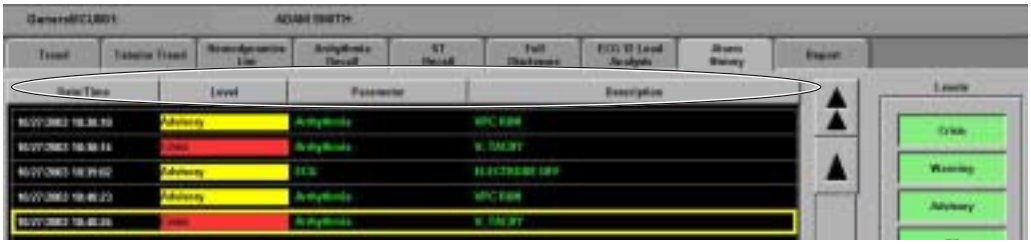
You can also scroll the file by touching the time bar.

Up to 15 files are displayed on the regular screen.
Up to 25 files are displayed on the Expand Individual Bed screen in dual display composition.

Sorting the List

Touch an item on the title bar to sort the list.

- Date/Time Sort by file creation date and time
- Level Sort by alarm level (Crisis, Warning, Advisory)
- Parameter Sort in the following order
    1. Arrhythmia alarm
    2. Alarms related to ECG
    3. Alarms of parameters in priority
    4. Alarms not corresponding to parameters



Selecting the Alarm Levels and Types Displayed on the File List

Select the alarm levels or types whose alarm history is displayed on the file list window. Every touch toggles between selected and unselected.

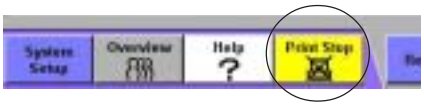
Touch “ALL” to select all alarm levels or all alarm types. If you touch “ALL” again, all alarm levels or all alarm types become unselected.

Recordings on the Alarm History Window

Alarm History Recording

Recording a Selected File

To print a file with the laser printer, touch “Print”.



To stop printing, touch “Print Stop”.

Other Recordings

The following recordings are also available on the Alarm History window with the WS-971R recorder unit.

Manual Recording

Automatic recording: Periodic recording, Alarm recording

Call recording

Remote delayed recording

Report Window

Overview 9.9.1
- Displaying the Report Window 9.9.1
- Window Description 9.9.1
- Report Mode 9.9.2
  - Manual Printing 9.9.2
  - Automatic Printing 9.9.2
- Printing Items 9.9.2
- Report Creating Flowchart 9.9.2

Changing Report Settings 9.9.3
- Setting Printing Format 9.9.3
  - Setting the Report Mode 9.9.3
  - Selecting Printing Items 9.9.3
  - Setting Report Range 9.9.3
- Setting Trend Data Printing 9.9.5
  - Changing Trend Interval 9.9.5
  - Changing Printing Parameters 9.9.5

Entering Comments 9.9.6
- Using Template to Enter a Comment 9.9.6

Printing on the Report Window 9.9.7
- Manual Printing 9.9.7
- Automatic Printing 9.9.7

Overview

On the Report window, you can create and print a report.

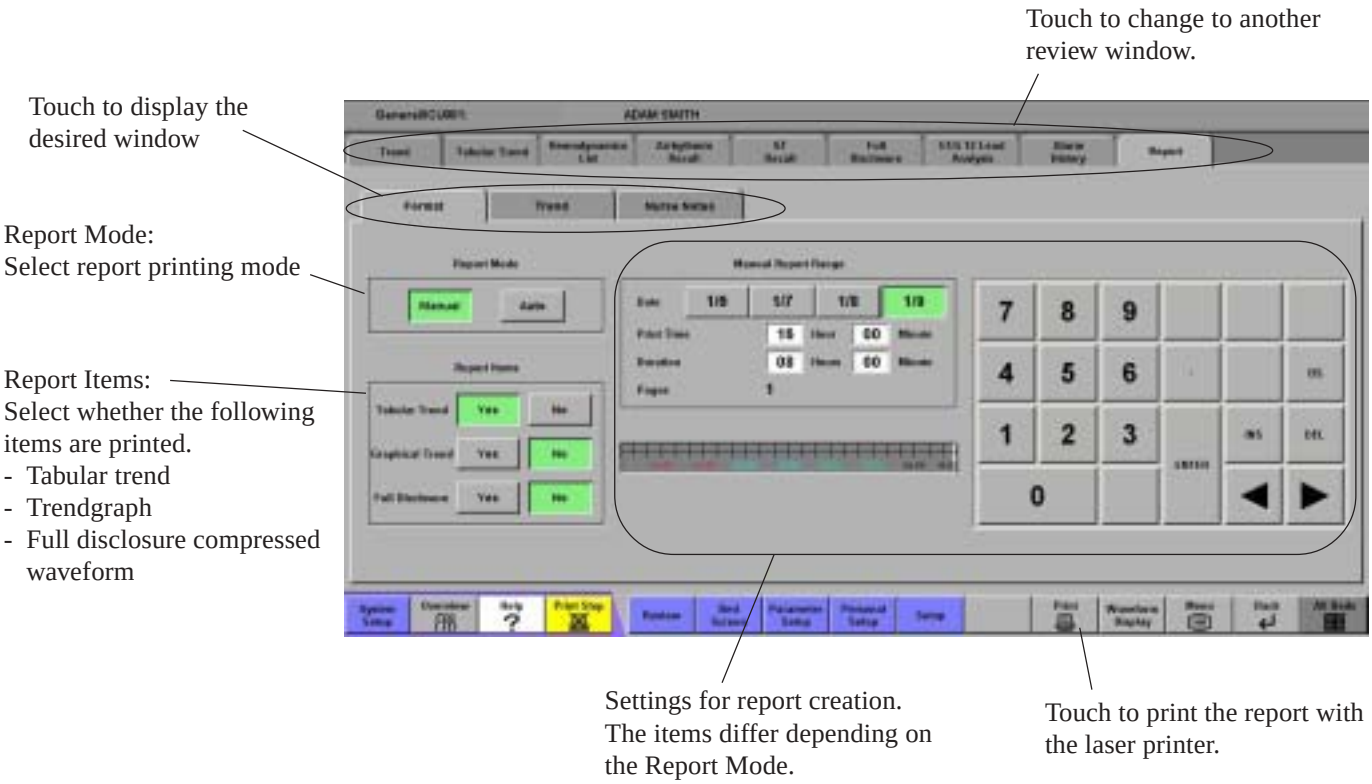
Displaying the Report Window

1. Touch the basic information window of the bed you want to display the Report window of.

2. Touch “Menu” to display the Menu screen.

3. Touch “Report” to display the Report window.

Window Description


Touch to change to another review window.
Touch to display the desired window
Report Mode:
Select report printing mode
Report Items:
Select whether the following items are printed.
- Tabular trend
- Trendgraph
- Full disclosure compressed waveform
Settings for report creation.
The items differ depending on the Report Mode.
Touch to print the report with the laser printer.

Report Mode

There are two types of report printing: manual and automatic.

NOTE

Automatic printing is only available at the central monitor where the bed's data are saved. The report mode is fixed to manual at central monitors where the bed's data is not saved.

Manual Printing

In manual printing, a patient's past data (data which is already saved in the central monitor) can be printed as a report.

Automatic Printing

In automatic printing, reports of preset contents are automatically printed at the preset intervals.

Printing Items

You can print the following items.

- Patient information
- Report creation date and time
- Report creation conditions
- Comment
- ECG waveform (5-second waveform 5 minutes before the end time of the printing data)
- Tabular trend
- Trendgraph
- Full disclosure compressed waveform

Comment, ECG and patient information are printed on the report cover.
To print the cover, set "Report Cover Sheet" to ON on the System Configuration window of System Setup. The default setting is OFF.

Report Creating Flowchart

A report is created and printed by the following steps.

Display the Report window.

▼

Set the settings for report format.

▼

Set the settings for trend data printing.

▼

Enter comments.

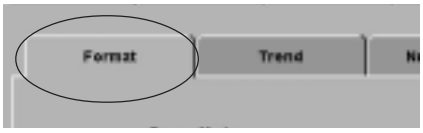
▼

Print the report.

Changing Report Settings

Settings are categorized into format settings and trend data settings. Touch the tab to change the setting window.

Setting Printing Format



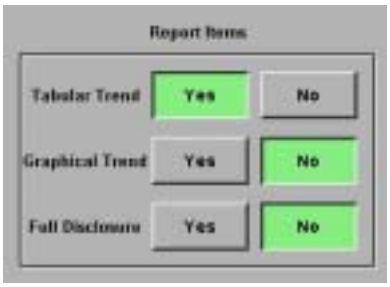
Touch “Format” to display the Format window.

Setting the Report Mode

Touch “Manual” or “Auto” to select whether report creation and printing are done manually or automatically.

NOTE

Automatic printing is only available at the central monitor where the bed’s data are saved. The report mode is fixed to manual at central monitors where the bed’s data is not saved.



Selecting Printing Items

Set whether or not the following items are printed by touching “Yes” or “No”.

- Tabular trend
- Trendgraph
- Full disclosure compressed waveform

NOTE

When the patient’s data is not saved at any central monitor, these settings are not available.

Setting Report Range

Set the printing start date and printing duration. The approximate number of printed pages is displayed.

Manual recording

The patient’s past data is printed as a report. To change settings, touch the item you want to set and then touch a numeric pad key. Set printing start time and printing duration and then touch “Print” to start printing.

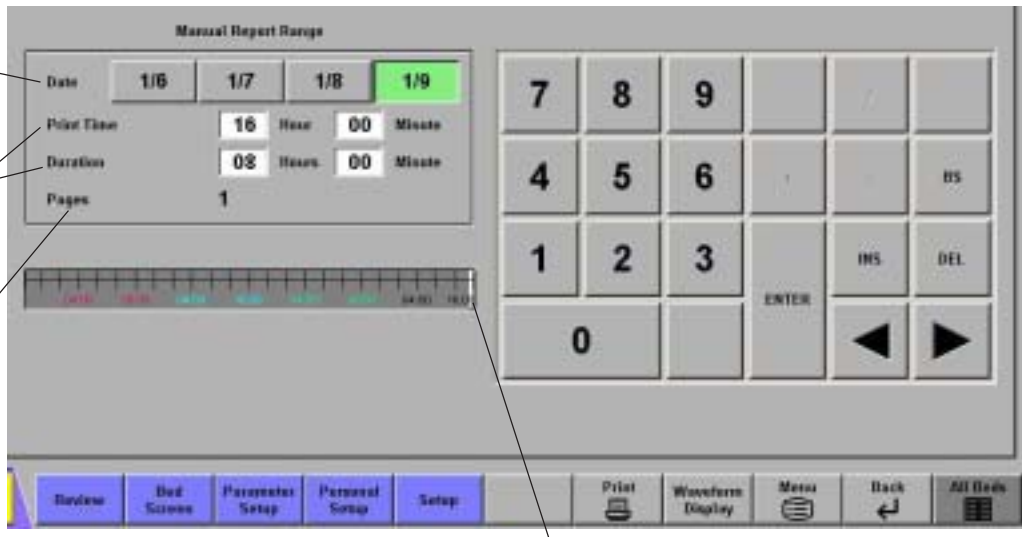
NOTE

When the selected report range includes future time, the data of the future part is not included in the report.

Date:
Touch the key for the start date of printing data

Print Time, Duration:
Touch the item you want to set and then enter from the numerical pad to the right.

Approximate printing pages



The white part is printed.

Automatic Printing

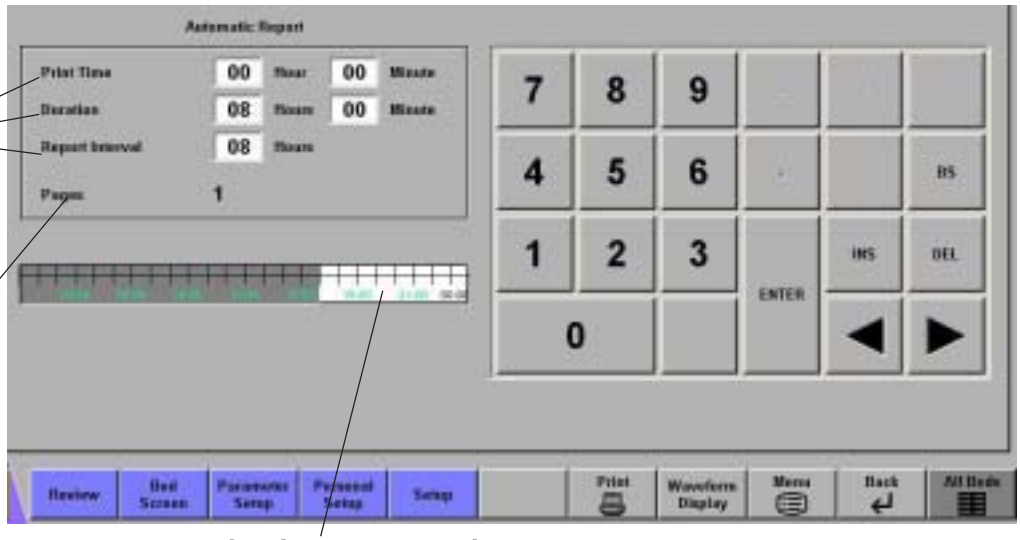
Reports of preset contents are automatically printed at the preset intervals. The report of the preset printing duration is automatically created. Data up until the printing start time is printed. When one report printing finishes, the printing start time is automatically renewed according to the printing interval setting.

NOTE

You cannot set the printing interval shorter than the printing duration. If a printing interval shorter than the printing duration is entered, the printing interval is automatically modified to the same value as the printing duration.

Print Time, Duration, Report Interval:
Touch the item you want to set and then enter from the numerical pad to the right.

Approximate printing pages



The white part is printed.

Setting Trend Data Printing

Touch "Trend" to display the Trend setting window.

Changing Trend Interval

Set the interval to print tabular trend. Touch the key of the desired interval.

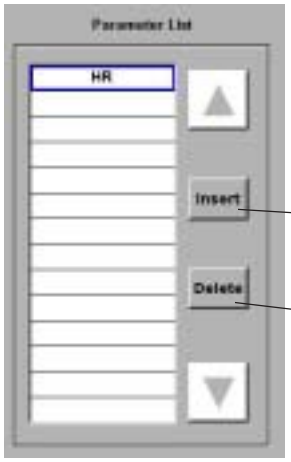
NOTE

When "NIBP" is selected, only the data for the time NIBP is measured is printed.

Changing Printing Parameters

Set the parameters to be printed for trendgraph and tabular trend.

1. Touch any item or blank space in the Parameter List where you want to change the setting. You can insert a new item by touching "Insert". When you touch a space which already has a setting, the setting is overwritten.



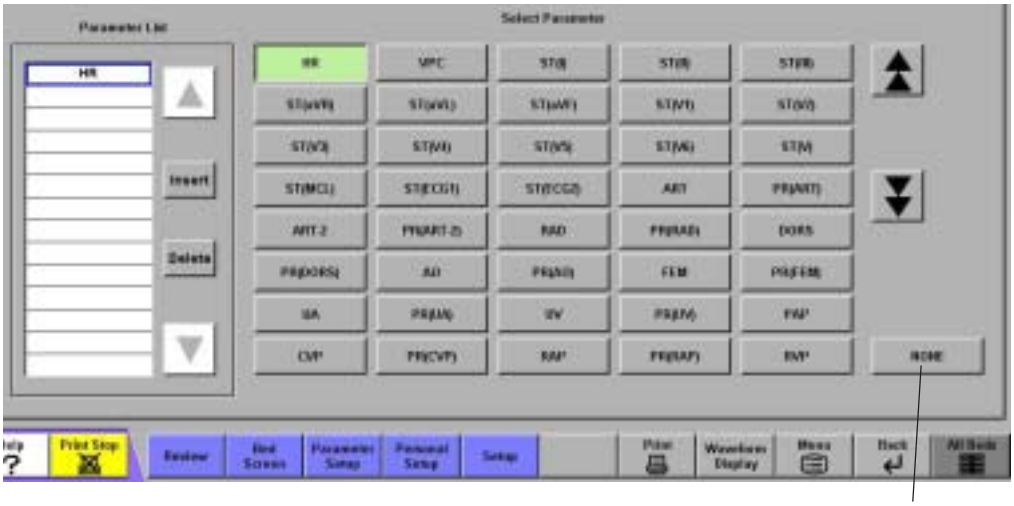
Touch to insert a new item in the selected space

Touch to delete the selected item

2. Touch a parameter in the Select Parameter area. The selected parameter is displayed in the space selected in step 1.

NOTE

When "NIBP" is selected for trend interval, all the NIBP related parameters are automatically added as printing parameters at the end of the list.



Touch to unselect all items

Entering Comments

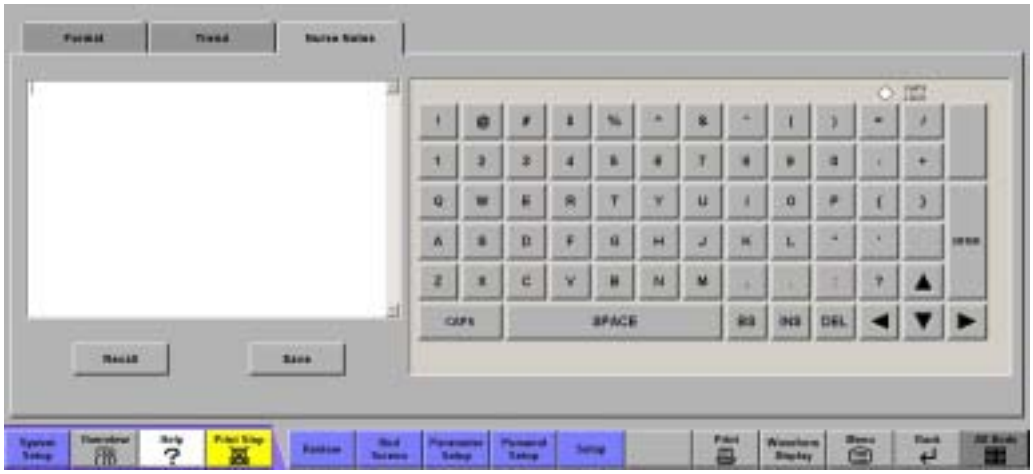
You can print comments in the report.

NOTE

- **The comment is printed on the cover page. To print the cover, set "Report Cover Sheet" to ON on the System Configuration window of System Setup. The default setting is OFF.**
- **When a bed is monitored by several central monitors, the comment entered at one central monitor is saved only in that central monitor. Other central monitors and the bedside monitor do not share comments entered at a different central monitor.**

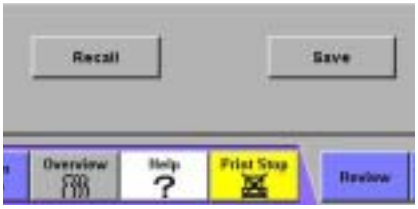
1. Touch "Nurse Notes" to display the Nurse Notes window.

2. Enter comments with the keyboard on the Nurse Notes window.



Using Template to Enter a Comment

You can save one comment you often use.



Saving a template

Enter the comment in the template and then touch "Save".

Recalling a Template

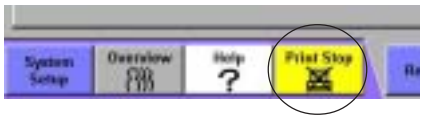
Touch "Recall". The comment in the template is copied to the comment column. Any previous comment in the comment column is overwritten.

Printing on the Report Window

You need to confirm report setting before printing. To print comments, enter them in advance. To print the cover page, set “Report Cover Sheet” to ON on the System Configuration window of System Setup. The default setting is OFF.

Manual Printing

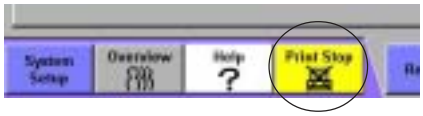
Touch “Print” to start printing.



To cancel printing, touch “Print Stop”.

Automatic Printing

Reports of preset contents are automatically created and printed at the preset intervals.



To cancel printing, touch “Print Stop”. If you cancel printing, all pending printing reports are also canceled.

Section 10 Recording

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Overview

This central monitor has three recording types.

- Manual recording
- Automatic recording
- Remote recording

This central monitor can be connected to the following two optional devices below.

WS-971R recorder unit
(paper width 50 mm)
Touch the “Record” key or “REC” key to record with the WS-971R recorder unit.

Laser printer
(A4 or letter paper size)
Touch the “Print” key to print with the laser printer.

Description of Recording Modes

Manual Recording

Recording type	Recorded data	Recording time	How to start recording	Available screen
Delayed waveform recording	• Delayed waveform displayed in the All Beds screen • Numerical data at the recording start time	"Manual Recording" on the Recording window of the System Setup*	"REC"	All screens with "REC"
All Beds Recording		10 seconds × the number of all beds	"Record"	All Beds screen
Dual Waveform Recording	• Two waveforms selected at "Recording Pattern" on the Recording window of the Setup • Numerical data at the recording start time	"Manual Recording" on the Recording window of the System Setup*	"Record"	Individual Bed screen, Overview Bed screen
Multi-Wave Printing	• Waveforms of all parameters displayed on the screen • Numerical data at the recording start time	10 seconds*	"Print"	Individual Bed screen, Overview Bed screen (when display type is "Wave Display")
ECG 12 Lead Printing	• All ECG waveforms displayed on the screen (up to 12 leads) • Numerical data at the recording start time	---	"Print"	Individual Bed screen, Overview Bed screen (when display type is "ECG 12 Lead Display")
Trendgraph printing	Displayed trendgraph	Displayed time width	"Print"	Trend window
Tabular Trend printing	Displayed tabular trend	Displayed 10 rows	"Print"	Tabular Trend window
Hemodynamics List printing	Displayed hemodynamics list	Displayed 9 rows	"Print"	Hemodynamics List window
Arrhythmia Recall Recording/Printing	• Displayed arrhythmia recall waveforms (top two waveforms in multi-wave display) • Numerical data	8 or 10 seconds**	"Record"	Arrhythmia Recall window
	• Displayed arrhythmia recall waveforms • Numerical data		"Print"	Arrhythmia Recall window-Expanded waveform display
	Arrhythmia recall files with printing mark (up to 12 files) • Arrhythmia recall waveforms • Numerical data • Caliper measurement data		"Print"	Arrhythmia Recall window-File list display
Arrhythmia Recall Caliper Measurement Data Printing	Arrhythmia recall files with caliper measurement data • Arrhythmia recall waveforms • Numerical data • Caliper measurement data	8 or 10 seconds**	"Print"	Arrhythmia Recall window-Expanded waveform display (with caliper measurement data)
ST Recall Recording/Printing	• Displayed ST recall file • Numerical data when the file is created.	---	"Record"	ST Recall window
	ST recall files with printing mark (up to 24 files) • ST recall waveforms • Numerical data		"Print"	
Full Disclosure Waveform Printing	Displayed full disclosure waveform	Depends on the number of displayed waveforms	"Print"	Full Disclosure window when compressed waveform is displayed

Recording type	Recorded data	Recording time	How to start recording	Available screen
Expanded Full Disclosure Waveform printing/recording	Expanded full disclosure waveform (top two waveforms in multi-wave display)	10 seconds	"Record"	Full Disclosure window when expanded waveform is displayed
	Displayed full disclosure waveform	1 waveform: 40 seconds 2 waveforms: 20 seconds More than 3 waveforms: 10 seconds	"Print"	
Full Disclosure Waveform Caliper Measurement Data Printing	• Full disclosure waveforms and numerical data for which caliper measurement is done • Caliper measurement data	10 seconds	"Print"	Full Disclosure window when expanded waveform is displayed (with caliper measurement data)
ECG 12 Lead Analysis Result printing	The print result is different depending on: • Display type (Tabular Trend, Zoom In, Comparison, Analysis Report) • Regular screen or Expand Individual Bed screen Refer to Section 9 "ECG 12 Lead Window".			
Alarm History Printing	Currently displayed alarm history file list	---	"Print"	Alarm History window
Report printing	Patient name, bed name, 5-second ECG 1 waveform, full disclosure waveform, trend data, etc.	---	"Print"	Report window

* When printing frozen waveform, recording time is 6 seconds.

** Depends on the bedside monitor model.

Automatic Recording

These recordings automatically start at the preset time and under preset conditions.

Recording type	Recorded data	Recording time	How to start recording	Available screen
Periodic recording	• Delayed waveforms displayed on the All Beds screen • Numerical data at the recording start time	Set at "Periodic Recording" on the Recording window of the System Setup	Automatically starts	All screens and windows
Alarm recording	• Delayed waveforms displayed on the All Beds screen at the alarm occurrence • Numerical data at the alarm occurrence	Set at "Alarm/Call Recording" on the Recording window of the System Setup		

Remote Recording

Remote recording is performed when there is a recording request from a transmitter or a bedside monitor that is not connected to a recording device.

NOTE

- **Remote recording is available only at the central monitor where the bed's data is saved.**
- **The BSS-9800 bedside station and BSM-9510 bedside monitor select the central monitor which performs remote recording, and remote recording is only available at the selected central monitor.**

Recording from a Transmitter

The recording starts when the CALL button on the transmitter is pressed under the conditions below.

- When using a transmitter with a bedside monitor that is not connected to a recording device.
- When receiving data from a transmitter through the multiple patient receiver.

Recording type	Recorded data	Recording time	How to start recording	Available screen
Call recording	• Delayed waveform displayed on the All Beds screen • Numerical data of the recording start time	Set at "Alarm/Call Recording" on the Recording window of the System Setup	CALL button on the transmitter	All screens and windows

Recording from a Bedside Monitor

The recording starts when there is a recording request from a bedside monitor that is not connected to a recording device.

NOTE

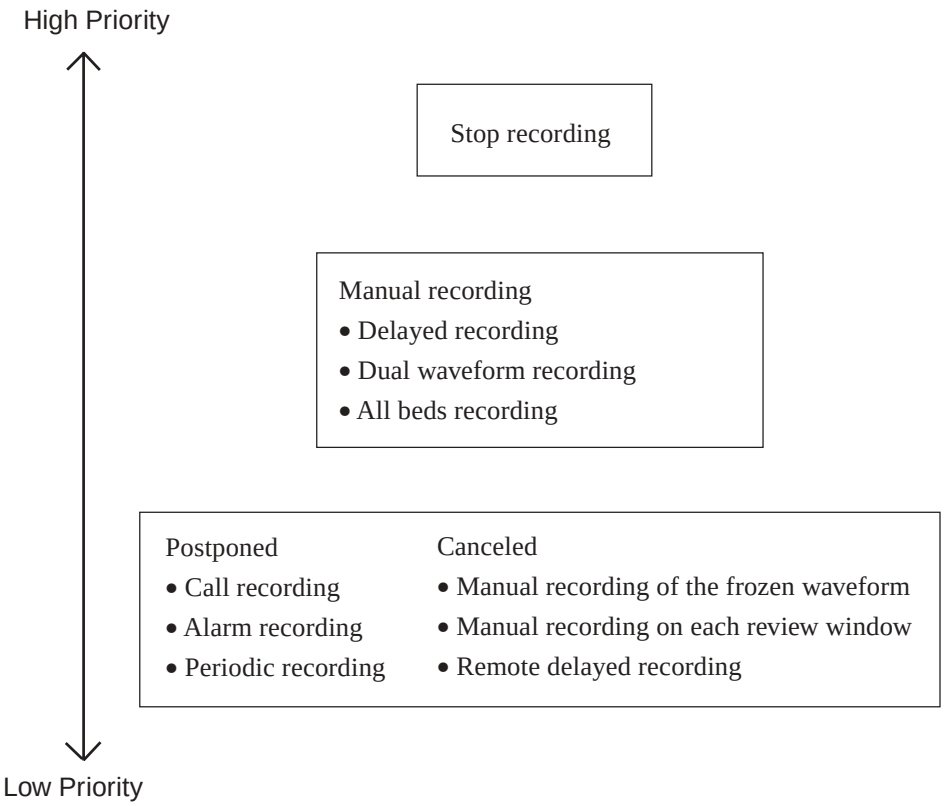
Remote recording from the 8000 series beds are not available.

Recording type	Recorded data	Recording time	How to start recording	Available screen
Remote delayed waveform recording	• Waveform selected at the bedside monitor. • Numerical data at the recording start time	Continues until "REC" for the bed is touched.	Request from the bedside monitor	All screens and windows

Recording Priority

Recorder unit (WS-971R)

When using the WS-971R recorder unit, the following recording priority applies.



If more than one recording mode is activated at the same time, only the highest priority mode is used.

If delayed recording, dual waveform recording, or all beds recording occurs during any other type of recording, the other recording is canceled.

During any type of recording, if an equal priority recording occurs, that recording is not performed; only the current recording is performed.

During call recording, alarm recording and periodic recording, if a higher priority recording occurs, the current recording changes to standby and is continued as soon as the recording device is available.

During manual recording of the frozen waveform, manual recording on each review window and remote recording, if a higher priority recording occurs, the current recording is canceled.

If the recorder is currently printing when you touch the REC key, the current recording stops and the delayed recording you requested is started.

Laser Printer

When printing with the laser printer there is no priority; priority does not apply.

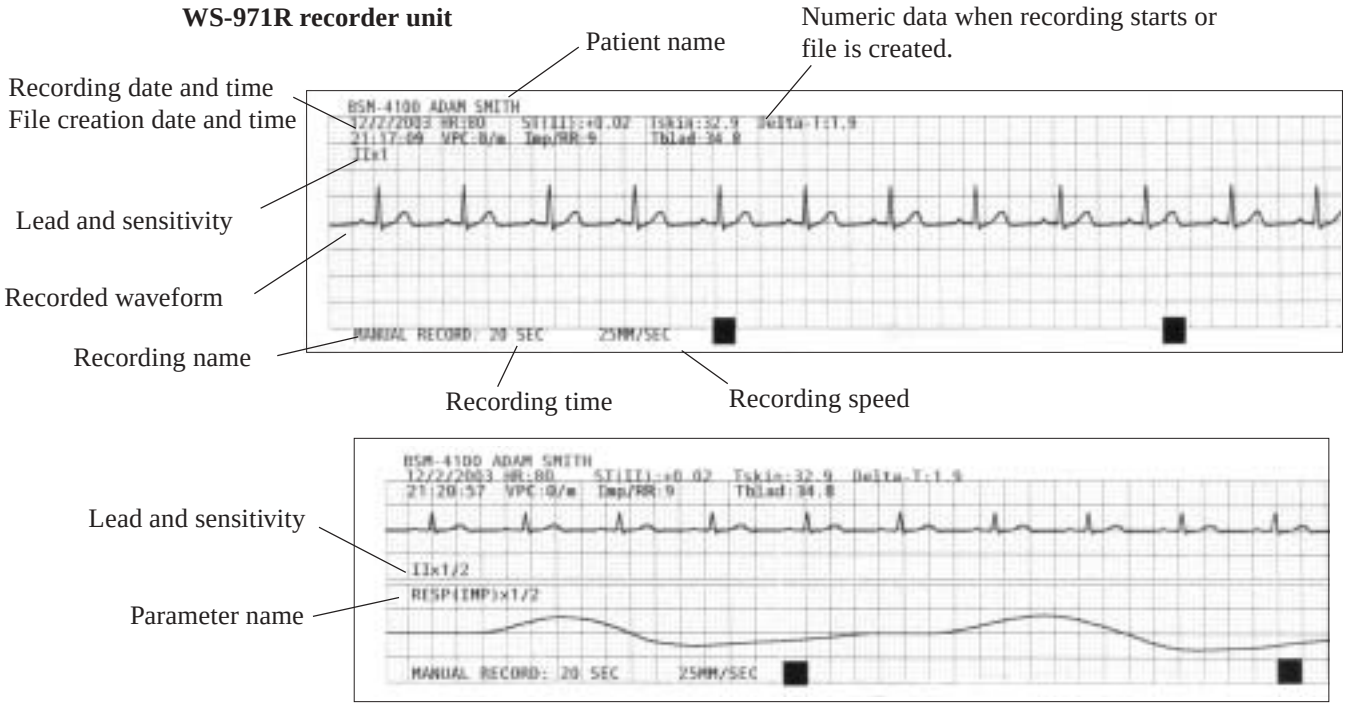
Recording Sensitivity

The sensitivity of the waveforms recorded on the recording paper depends on the sensitivity of the waveforms displayed on the screen.

Display Sensitivity	Recording Sensitivity	
	Single Wave	Dual Wave
× 1/4	× 1/2	× 1/4
× 1/2	× 1/2	× 1/4
× 3/4	× 1	× 1/2
× 1	× 1	× 1/2
× 3/2	× 1	× 1/2
× 2	× 2	× 1
× 4	× 2	× 1

Recorded/Printed Data

WS-971R recorder unit



Record name list

Recording type		Recorded name
Delayed waveform recording		MANUAL RECORD: (recording time)
All Beds recording		ALL BEDS RECORD
Dual Waveform recording		DUAL WAVE RECORD
Arrhythmia Recall recording		ARRHY RECALL
ST Recall recording		ST RECALL
Expanded Full Disclosure Waveform recording		FULL DISCLOSURE ZOOM RECORD
Periodic recording		PERIODIC RECORD
Alarm recording	Vital	(parameter name) ALARM RECORD
	ST	ST (lead name) ALARM RECORD
	Arrhythmia	(arrhythmia name) ALARM RECORD
Call recording		CALL RECORD
Remote delayed waveform recording		NETWORK REM MANUAL RECORD : CONTINUOUS

Manual Recording

Manual recordings are the recordings generated by touching “Record” or “REC”. Waveforms and data on the screen are recorded.

Manual recordings except delayed waveform recording, all beds recording, alarm history recording and report recording are also available on the overview bed screen.

This section explains delayed waveform recording that can be done in the same way on each screen. For other recordings, refer to each section that explains the screen where the recording is performed.

Delayed Waveform Recording

Delayed waveform recording is available on all screens and windows with the “REC” key. Delayed waveform on the All Beds screen and numerical data are recorded.

Necessary Settings for Delayed Waveform Recording

Set the recording time at “Manual Record” on the Recording window of the System Setup. Set the Record sweep speed at “Other” on the Recording window of the Setup.

Starting Delayed Waveform Recording

Touch “REC” on the bed you want to record on the All Beds screen or “REC” on the basic information area. The recording starts. When recording of the recording time finishes, the recording device automatically stops.

All Beds screen

Basic information area

To stop recording, touch “REC” again.

Automatic Waveform Recording

Recording starts automatically at the preset recording condition. There are two automatic recording modes: periodic recording and alarm recording.

Periodic Recording

All delayed waveforms displayed on the All Beds screen and numerical data are recorded at the preset interval with the WS-971R recorder unit.

Necessary Settings for Periodic Recording

- Set the recording interval at “Periodic Recording” on the Recording window of the Setup. The factory default setting is OFF. Periodic recording is not performed when OFF is selected.
- Set the Record sweep speed at “Other” on the Recording window of the Setup.
- Set the recording time at “Periodic Recording” on the Recording window of System Setup.

To stop recording, touch “REC” on the bed during recording.

Alarm Recording

For alarm recording, refer to Section 6.

Remote Recording

Remote recording is performed when there is a recording request from a transmitter or a bedside monitor that is not connected to a recording device.

NOTE

- **Remote recording is available only at the central monitor where the bed's data is saved.**
- **The BSS-9800 bedside station and BSM-9510 bedside monitor select the central monitor which performs remote recording, and remote recording is only available at the selected central monitor.**

Necessary Settings for Remote Recording

Call Recording

- Set the recording time at "Alarm/Call Recording" on the Recording window of System Setup.
- Set "Call Record" to ON at "Alarm Recording" on the Recording window of the Setup.

Remote Recording

The recorded waveform is selected at the bedside monitor.

Starting Remote Recording

Call Recording

This recording starts when there is a recording request from a transmitter. Delayed waveforms displayed on the All Beds screen and numerical data are recorded with the WS-971R recorder unit.

To start recording, press the CALL button on the transmitter. The recorder automatically stops when recording of the preset recording time finishes.

To stop recording, touch "REC" on the bed on the All Beds screen or basic information area.

Remote Delayed Waveform Recording

NOTE

Remote recording from 8000 series beds are not available.

This recording starts when there is a recording request from a bedside monitor that is not connected to a recording device. The waveform and numerical data displayed on the bedside monitor is recorded with the WS-971R recorder unit.

On the bedside monitor press the key with the function to start recording. The recorder automatically stops when recording of the preset recording time finishes.

To stop recording, touch "REC" on the bed on the All Beds screen or basic information area.

Changing Recording Settings

You can change recording settings on the Recording window of the Setup or the Recording window of the System Setup.

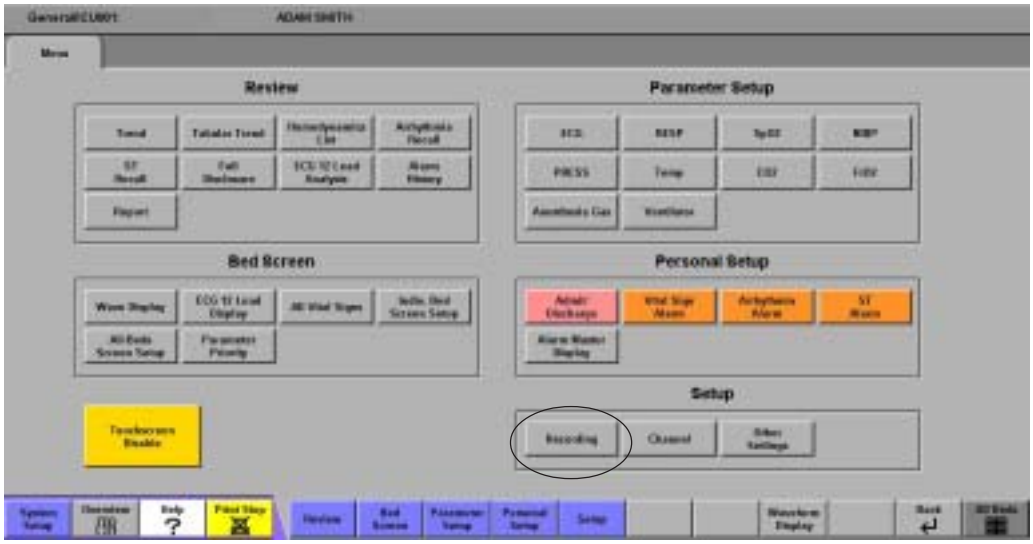
Changing Settings on the Recording Window of the Setup

To display the Recording window,

1. Touch the basic information area of the bed you want to change settings for.

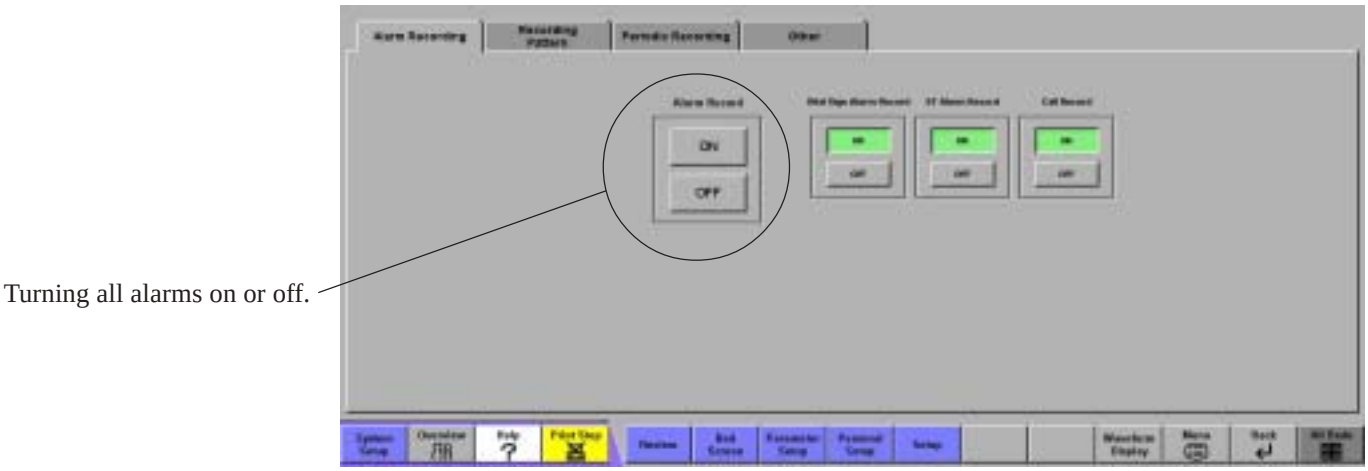
2. Touch “Menu” to display the Menu screen.

3. Touch “Recording”. The Recording window opens.



Changing Alarm Recording Settings

On the Recording window, touch “Alarm Recording”. Touch “ON” or “OFF” for each alarm recording mode to set whether or not the recording is performed. The settings on this window are synchronized with the settings on each alarm window of the Personal Setup.



ST Alarm Recording

NOTE

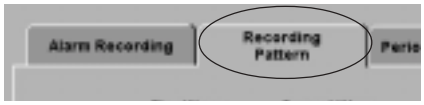
ST alarm recording is not available for 8000 series beds.

Call Recording

NOTE

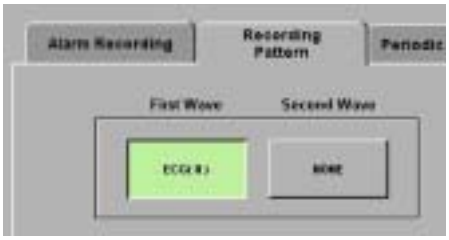
This setting is available only when the central monitor is receiving data from a transmitter.

Setting Recording Waveforms for Dual Waveform Recording

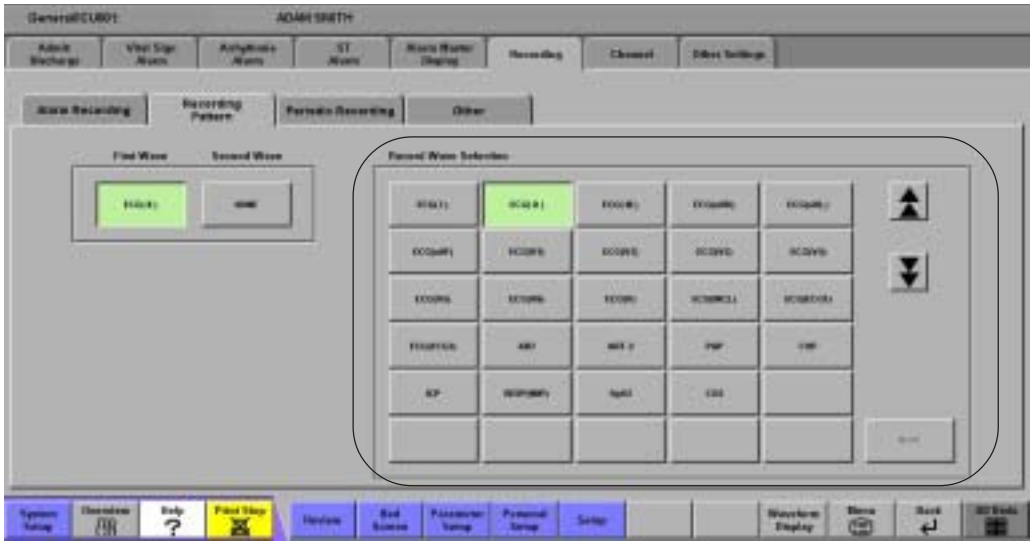


1. Touch “Recording Pattern” to display the setting window.

2. Touch either the “First Wave” or “Second Wave” key.



3. Touch the desired parameter at “Record Wave Selection” to set the parameter of the waveform.



NOTE

When “Second Wave” is set to “NONE”, only one waveform is recorded in dual waveform recording.

Changing Recording Interval of Periodic Recording

1. Touch “Periodic Record” to open the setting window.

2. Touch the desired recording interval (OFF, 30 min, 60 min, 120 min, FREE). The factory default setting is OFF. Periodic recording is not performed when OFF is selected.

When “FREE” is selected:

You can set any interval.

1. Touch “FREE”. The numeric pads appears.

2. Enter any interval with the numeric pads.

3. Touch “ENTER” to set the interval. If you don’t touch “ENTER”, the setting is not valid.

Setting the Record Sweep Speed

You can set the record sweep speed of the following:

- Delayed waveform recording
- All Beds recording
- Dual Waveform Recording
- Multi-Wave Printing (includes printing of the frozen waveform)
- ECG 12 Lead Printing (6rows × 2cols and 12rows ×1col only)
- Periodic recording
- Alarm recording

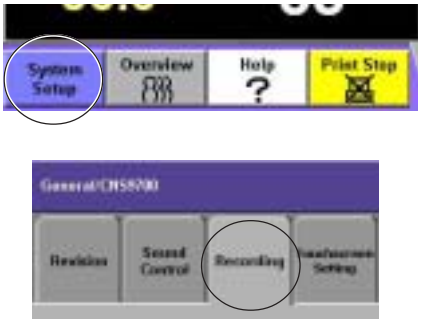
1. Touch “Other” to display the setting window.

2. Touch either “25 mm/s” or “50 mm/s” key. The default setting is 25 mm/s.

Changing Settings on the Recording Window of the System Setup Screen

Displaying the Recording Window of the System Setup Screen

Touch “System Setup” to display the System Setup and then touch “Recording” to display the Recording window.



Changing the Recording Time

Set the recording time of manual recording, periodic recording and alarm/call recording.

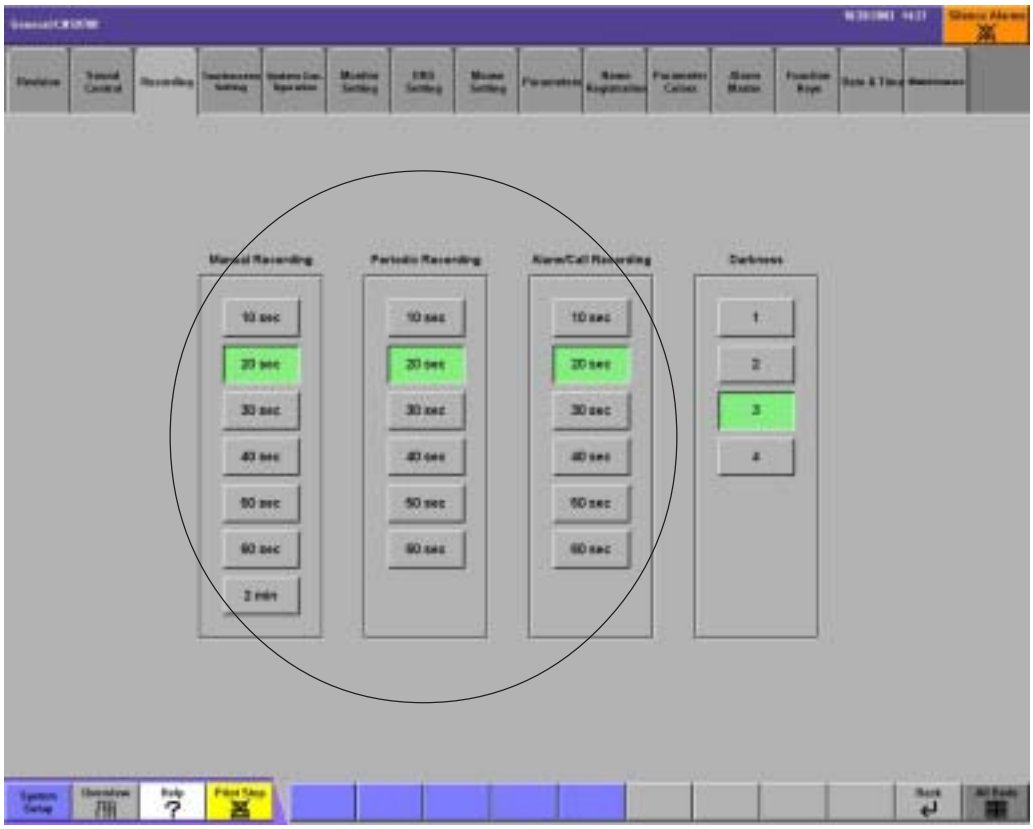
Setting range (The underlined values are the factory default settings.)

Manual recording: 10 sec, 20 sec, 30 sec, 40 sec, 50 sec, 60 sec, 2 min

Periodic recording: 10 sec, 20 sec, 30 sec, 40 sec, 50 sec, 60 sec

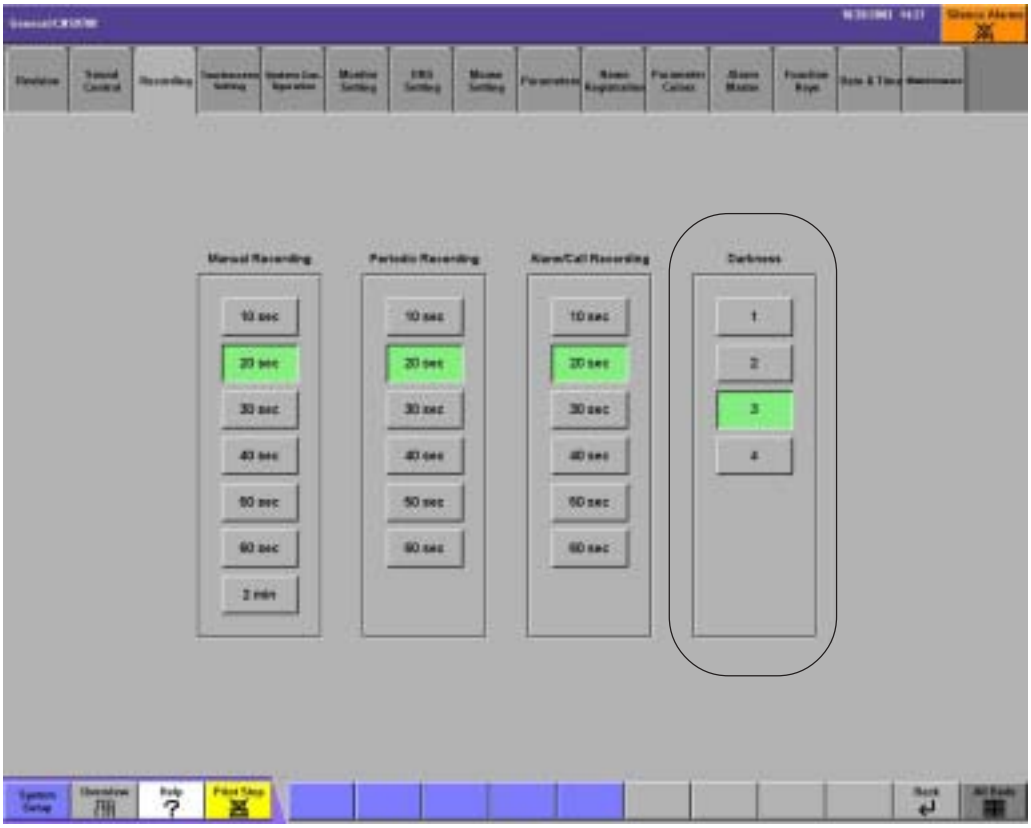
Alarm/call recording: 10 sec, 20 sec, 30 sec, 40 sec, 50 sec, 60 sec

Touch the recording time for each recording.



Adjusting the Grid Darkness

When the grid on the paper recorded by the WS-971R recorder unit is light, you can adjust the darkness of the grid at “Darkness”. Darkness of waveforms and letters is not adjusted. 1 is lightest and 4 is darkest.



Section 11 Overview Bed Screen

Overview 11.1
- Displaying the Overview Bed Menu Screen 11.1
- Alarm Function for an Overview Bed 11.2
- Screen Description 11.2

Selecting Another Bedside Monitor as an Overview Bed 11.3
Switching to Other Windows of the Overview Bed Screen 11.3
Recordings on the Overview Bed Screen 11.3

Overview

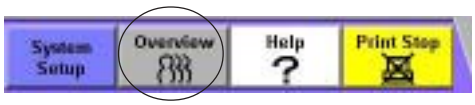
You can select an overview bed from up to 256 bedside monitors in the network that the central monitor is not continuously monitoring, and display the waveforms and data of the bedside monitor on the Overview Bed screen.

The following table shows the available operations on the Overview Bed screen.

Item		Individual Bed screen of monitored beds	Overview bed screen
Individual Bed screen	Wave display window	Yes	Yes
	ECG 12 lead display window	Yes	Yes
	All vital signs window	Yes	Yes
	Individual Beds screen display settings	Yes	Yes
	Parameter priority	Yes	Yes
Review windows	Trendgraph	Yes	Yes
	Tabular trend	Yes	Yes
	Hemodynamics	Yes	Yes
	Arrhythmia recall	Yes	Yes
	ST recall	Yes	Yes
	Full disclosure	Yes	Yes
	ECG 12 lead analysis	Yes	Yes
	Alarm history	Yes	No
	Report	Yes	No
Personal Setup	Admit/discharge	Yes	No
	Alarm settings	Yes	No
Setup	Recording settings	Yes	Yes
	Channel settings	Yes	No
	Other settings	Yes	No

Displaying the Overview Bed Menu Screen

Touch “Overview” to display the Overview Bed Menu screen.



Alarm Function for an Overview Bed

Alarm indication (alarm sound and screen indication) on the Individual Bed screen of the Overview Bed screen are the same as those on the Individual Bed screen of the monitored bed. Alarm level for each alarm type is also the same. However, alarm recording is not performed for an overview bed.

When a screen other than the Overview Bed Screen is displayed and an alarm occurs on the currently selected overview bed, the alarm message is displayed in red at the top of the screen.

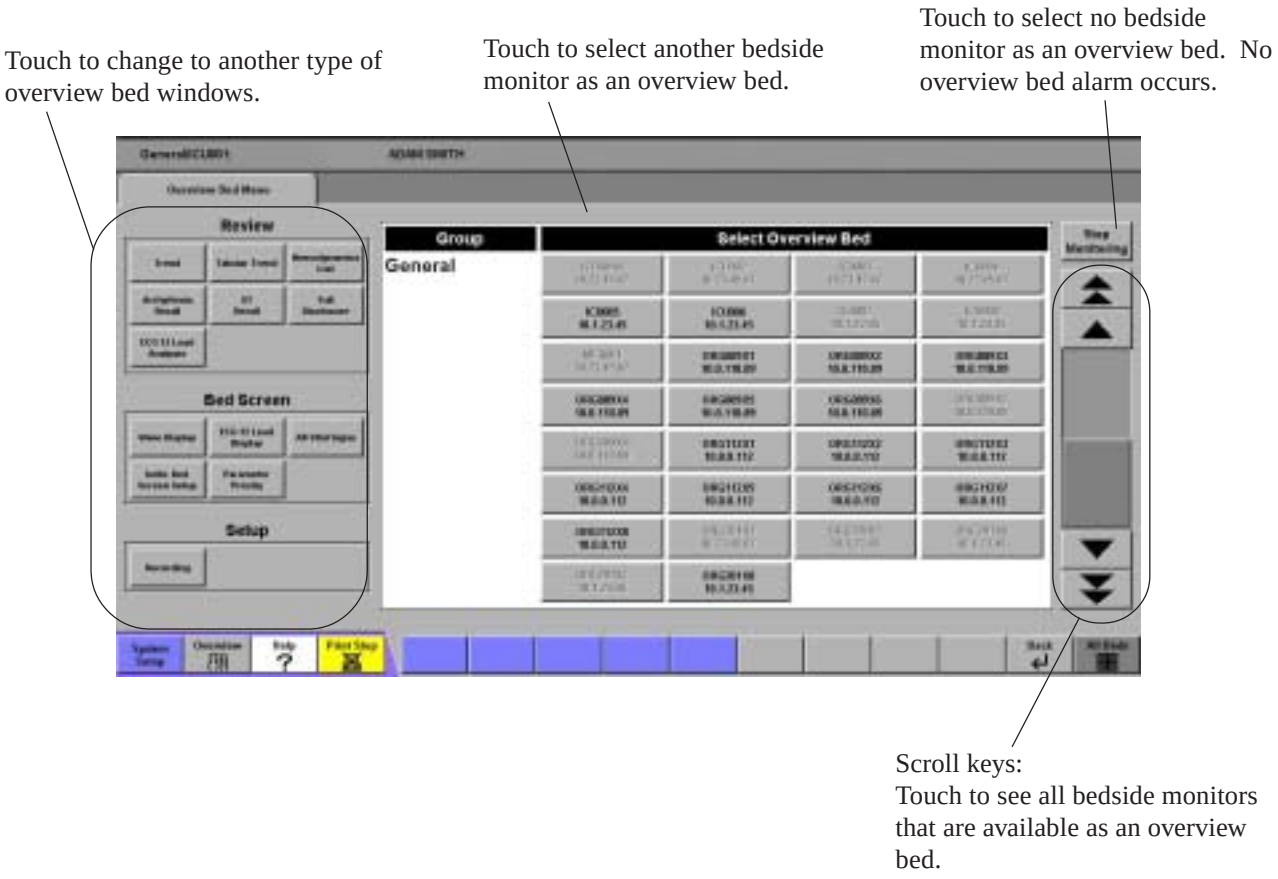
Overview bed alarm occurs only for the alarm on the currently selected overview bed displayed on the Overview Bed screen.

The overview bed alarm cannot be silenced by touching “Silence Alarms”.

To stop the overview bed alarm, touch “Stop monitoring” on the Overview Bed Menu screen.

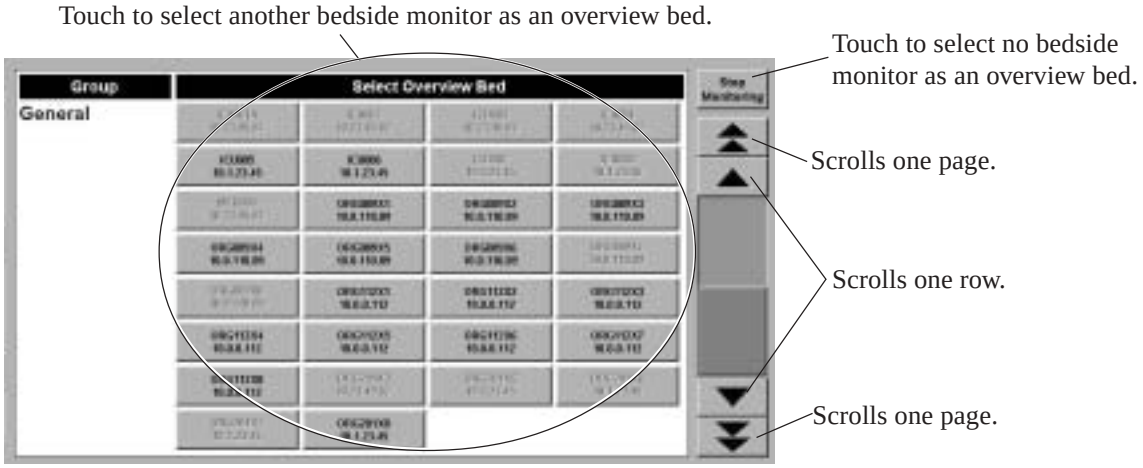
Screen Description

The Overview bed screen consists of the Overview Bed Menu screen and windows accessed from it. From the Overview Bed Menu screen, you can go to any kind of overview bed window.


Touch to change to another type of overview bed windows.
Touch to select another bedside monitor as an overview bed.
Touch to select no bedside monitor as an overview bed. No overview bed alarm occurs.
Review
Bed Screen
Setup
Group
General
Select Overview Bed
Scroll keys:
Touch to see all bedside monitors that are available as an overview bed.

Selecting Another Bedside Monitor as an Overview Bed

On the Overview Bed Menu screen, touch the desired bed name key in “Select Overview Bed”.


Touch to select another bedside monitor as an overview bed.
Touch to select no bedside monitor as an overview bed.
Group
Select Overview Bed
General
Scrolls one page.
Scrolls one row.
Scrolls one page.

Switching to Other Windows of the Overview Bed Screen

On the Overview Bed Menu screen, touch a key of a desired window.
Each window of the Overview Bed Screen has the same displays and settings as the windows for the monitored beds are available.

Recordings on the Overview Bed Screen

On the review window and Individual Bed screen of the Overview Bed Screen, you can perform the same recordings as those available for monitored beds. However, automatic recording and remote recording cannot be performed.

Section 12 Parameter Setup

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Displaying Each Parameter Setup Window 12.2
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Setting the Displayed Parameters of Waveforms and Numerical Data 12.21
Anesthesia Gas Settings 12.21
Ventilator Settings 12.22

Overview of Parameter Setup

Parameter Setup sets measurement conditions of each parameter. These settings can be set individually for each bed. The available setting items depend on the bed type.

: Settings only available for beds connected via the ORG-9200/9700 multiple patient receiver.

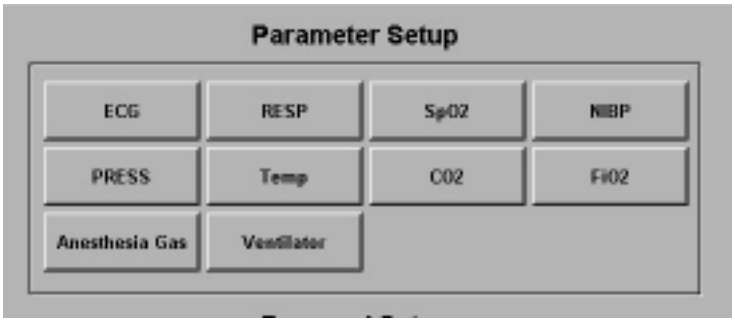
Setting Item	Description
ECG	Setting vital sign alarms
	Setting arrhythmia alarms
	Setting analysis lead
	Setting QRS detection settings
	Setting ECG lead names
	Setting ST analysis point
	Setting ST interval
	Setting electrode lead off alarm
	Turning noise alarm ON/OFF
	Turning arrhythmia analysis ON/OFF
	Turning pacing detection ON/OFF
	Turning hum filter ON/OFF
	Turning pacing marker ON/OFF
RESP	Setting vital sign alarms
	Turning respiration measurement ON/OFF
	Setting respiration detection sensitivity
SpO_2	Setting vital sign alarm
	Turning SpO_2 status alarm ON/OFF
NIBP	Setting vital sign alarms
	Setting measurement interval
	Starting/Stopping NIBP measurement
PRESS	Setting vital sign alarms
	Setting labels
	Setting display patterns
TEMP	Setting vital sign alarms
	Setting labels
	Setting equation for ΔT
CO_2	Setting vital sign alarms
FiO_2	Setting vital sign alarms
Anesthesia Gas	Setting vital sign alarms
	Setting displayed parameters of waveforms and numerical data
Ventilator	Setting displayed parameters of waveforms and numerical data

Displaying Each Parameter Setup Window

1. Touch the basic information area of the bed you want to set the settings for.

2. Touch “Menu” to display the Menu screen.

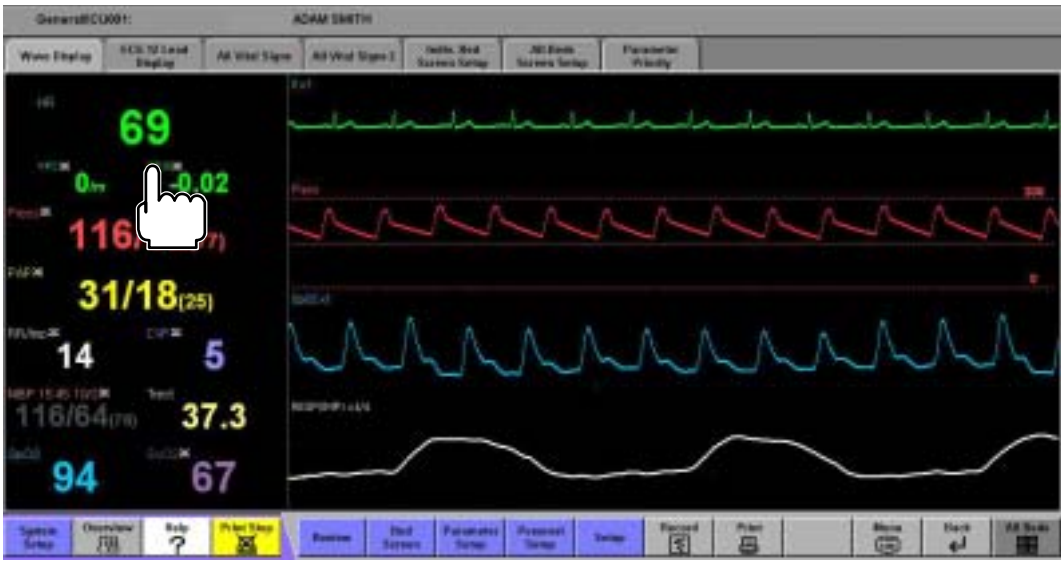
3. Touch each parameter key of Parameter Setup to display the setting window for the parameter.



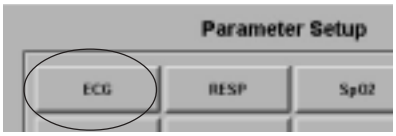
Or,

On the individual bed screen, touch the parameter you want to display the setting window for. The setting window for the parameter opens.

(example: when opening the ECG window)



ECG Settings



ECG settings are set on the ECG window. On the Menu screen, touch “ECG” to display the ECG window. The ECG window is divided into the following seven categories. Touch the tab of the category name to switch to another category.

- Vital Sign Alarm
- Arrhythmia Alarm
- Analysis Lead
- QRS Detection Sensitivity
- ECG Lead Name
- ST
- Other Settings

Setting Vital Sign Alarms

Set the HR and ST alarm upper/lower limits. The setting procedure is the same as on the Vital Sign Alarm window of the Personal Setup. Refer to Section 6.

Setting Arrhythmia Alarms

The setting procedure is the same as on the Arrhythmia Alarm window of the Personal Setup. Refer to Section 6.

Setting the Analysis Lead

NOTE

This setting is only available for beds connected via the ORG-9200/ 9700 multiple patient receiver.

Set the analyzed ECG lead. When you set both Arrhythmia Detection Lead 1 and 2, dual ECG lead analysis can be done.

1. Touch “Analysis Lead” to switch to the setting window.

2. Touch the key for the desired lead name in “Arrhythmia Detection Lead 1” or “Arrhythmia Detection Lead 2”. “Arrhythmia Detection Lead 2” appears only when dual ECG lead analysis is available for the patient.

Setting QRS Detection

NOTE

This setting is only available for beds connected via an ORG-9200/9700 multiple patient receiver.

Setting QRS Detection Settings

Set the threshold level for the QRS detection that is used for ECG analysis. The threshold level can be set automatically or manually.

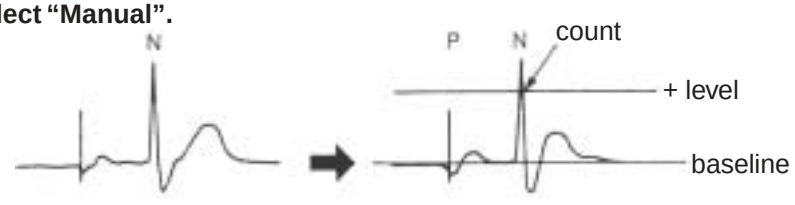
When you set the threshold automatically, you need to set the QRS detection threshold. When you set the threshold manually, you need to select the lead for QRS detection and the upper/lower value of the threshold level.

1. Touch “QRS Detection Sensitivity” to open the setting window.

2. Touch “Auto” or “Manual” in “QRS Detection”.

NOTE

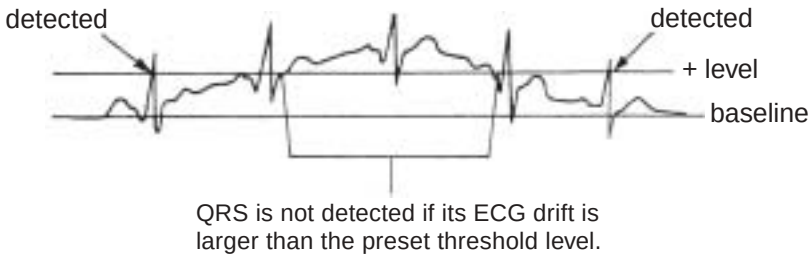
- **For a patient with a pacemaker whose waveform is difficult to detect, select “Manual”.**



If set to Auto, there is a possibility of double counting.

If set to Manual, QRSs are counted correctly.

- **For a patient whose ECG baseline fluctuation is large, select "Auto".**

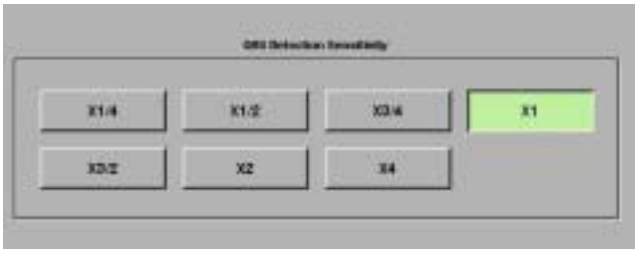


Setting QRS Detection Sensitivity in Auto Detection

When you select "Auto" in "QRS Detection", set the QRS detection threshold. Touch the key for the desired sensitivity in "QRS Detection Sensitivity". (The factory default setting is set to ×1)

When heart rate counting is incorrect because the ECG waveform is too large or small, change the QRS detection sensitivity.

- For too large ECG: Select smaller sensitivity.
- For too small ECG: Select larger sensitivity.

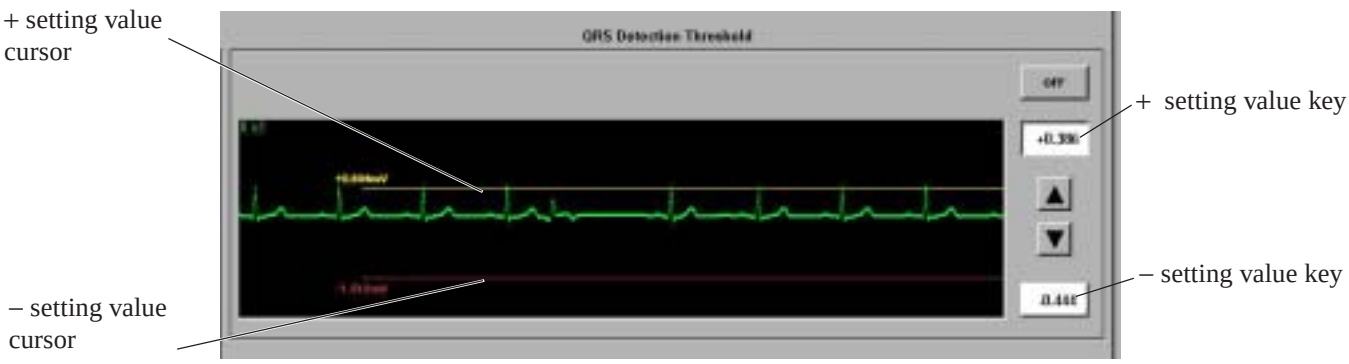


Setting QRS Detection Lead and Threshold in Manual Detection

When you select "Manual" in "QRS Detection", set the QRS detection lead and detection threshold.

1. In "QRS Detection Lead", touch the key for the lead you want to set the QRS detection threshold for.

2. In "QRS Detection Threshold", touch the + setting value or - setting value key and then set the value with the "▲" or "▼" key. You can also set the value with the ↓ or ↑ key on the keyboard. The cursor moves together with the selected value. When you do not set the threshold, touch "OFF".



Setting ECG Lead Name

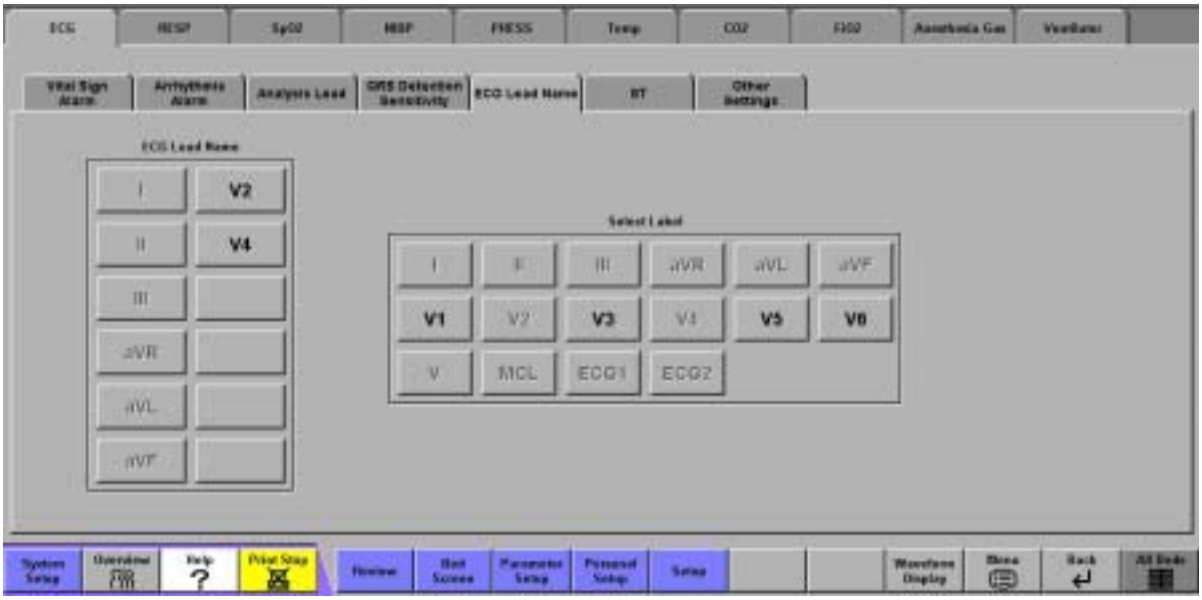
Select the ECG lead name to be displayed on the screen.

NOTE

- **This setting is only available for beds connected via the ORG-9200/ 9700 multiple patient receiver.**
- **This setting only changes the lead name displayed on the screen. It does not change the ECG lead measured at transmitters or bedside monitors. This setting can only be set when receiving from a transmitter without lead switching function.**

1. Touch “ECG Lead Name” to open the setting window.

2. After you select the key in “ECG Lead Name”, touch to select the label on the right side.



ST Settings

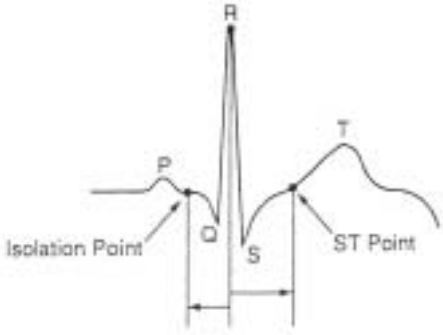
Setting the ST Analysis Point

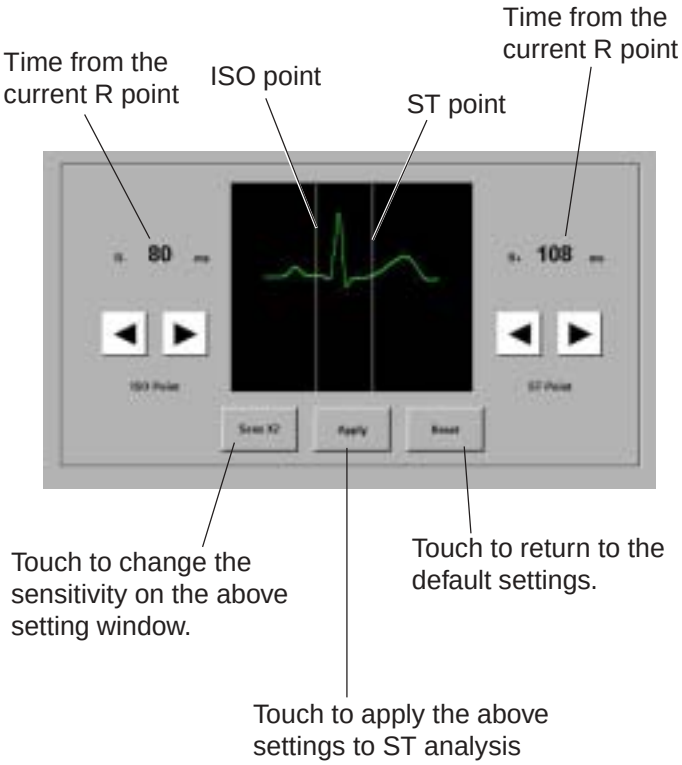
NOTE

This setting is only available for beds connected via the ORG-9200/ 9700 multiple patient receiver.

1. Touch “ST” to open the setting window.

2. Touch “◀” or “▶” at ISO point and ST point to set each value.
   One press of “◀” or “▶” increases or decreases the value by 4 ms. The cursors on the screen that represent each point move together with the value. You can also move the cursor by touching the waveform.




Time from the current R point
ISO point
ST point
Time from the current R point
80
108
Touch to change the sensitivity on the above setting window.
Touch to return to the default settings.
Touch to apply the above settings to ST analysis

Item	Setting Range	Steps	Factory Default Setting
ISO point	0 to 248 (ms)	4	80
ST point	0 to 340 (ms)	4	108

Setting the ST Interval

Set the interval where ST recall files are saved.

1. Touch “ST Interval”. The ST File Interval window opens.

2. Touch the desired interval.

NOTE

When the interval is set to 30 seconds, files for 72 hours cannot be saved. To save files for 72 hours, set the interval to one minute or longer. When the interval is set to 30 seconds, files for maximum 36 hours can be saved.

Setting Other Settings

Touch “Other Settings” to open the setting window.

Setting Electrode Lead Off Alarm

NOTE

This setting is only available for beds connected via the ORG-9200/ 9700 multiple patient receiver.

Set the electrode lead off alarm on or off. Touch “Once”, “Cont” (continuous) or “OFF” in “Lead Off Alarm”.

Once: Alarm sound (bing bong) occurs once every 30 seconds and a message appears on the screen.

Cont: Alarm sound occurs continuously while the lead is detached.

OFF: Alarm does not occur.

Turning Noise Alarm ON/OFF

NOTE

This setting is only available for beds connected via the ORG-9200/ 9700 multiple patient receiver.

Set the noise alarm on or off. Touch “ON” or “OFF”.

Turning Arrhythmia Analysis ON/OFF

WARNING

When Arrhythmia Analysis is set to OFF, there is no arrhythmia alarm even when the alarm is set to ON.

NOTE

- **When arrhythmia analysis is set to OFF, the following operations for arrhythmia analysis are not performed.**
  - **Display of VPC count and ST measurement value**
  - **Generating arrhythmia alarms**
  - **Creating arrhythmia recall files**
  - **Arrhythmia alarm recording**
  - **Creating ST recall files**

Set arrhythmia analysis on or off.

Touch “ON” or “OFF” in “Arrhythmia Analysis”.

Turning Pacing Detection ON/OFF

WARNING

Turn the pacing detection to ON when monitoring a pacemaker patient. Otherwise QRS and pacemaker spike may not be distinguished and pacemaker failure may not be recognized.

NOTE

When you monitor a patient with a narrow width QRS and the monitor miscounts the QRS, set the pacing detection to OFF.

Select whether or not to reject the pacemaker spike from the heart rate count.
Touch “ON” or “OFF” in “Pacing Detection”.

Turning Hum Filter ON/OFF

Set the hum filter on or off. Set to ON when there is a lot of hum interference from the use of an electrical surgery unit or other instrument.
Touch “ON” or “OFF” in “Hum Filter”.

Turning Pacing Marker ON/OFF

Set whether or not to display pacing markers on the ECG waveform. Touch “ON” or “OFF” in “Pacing Marker”.

Pacing marker: The pacing spike is not displayed on the ECG waveform sent from a transmitter. When you turn pacing marker ON, pacing markers are displayed at the points where a pacing spike is detected.

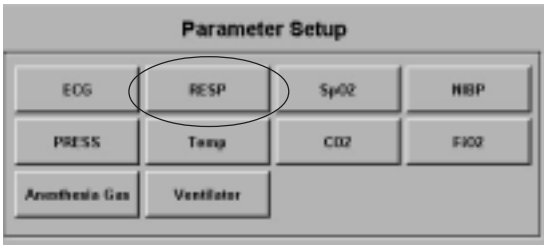
Pacing marker

Pacing Marker ON

Pacing Marker OFF

Respiration Settings

On the Menu screen, touch “RESP”. The RESP window opens.



Setting the Vital Sign Alarm

Set each respiration alarm upper/lower limits. The setting procedure is the same as on the Vital Sign Alarm window of the Personal Setup. Refer to Section 6.

Turning the Impedance Respiration Measurement ON/OFF

NOTE

- **Respiration settings are only available while measuring respiration.**
- **This setting is only available for beds connected via the ORG-9200/ 9700 multiple patient receiver.**

Set whether or not to use impedance method respiration measurement.

1. Touch “Resp Meas” to open the setting window.

2. Touch “ON” or “OFF”.

Changing the Respiration Detection Sensitivity

NOTE

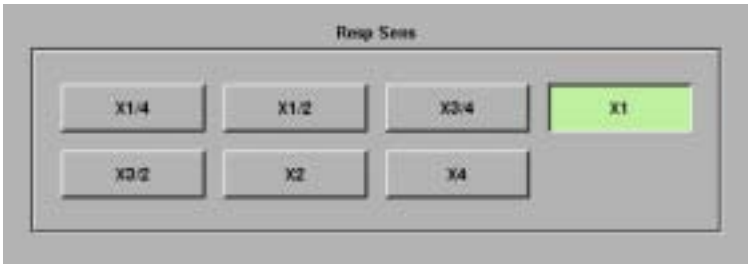
This setting is only available for beds connected via the ORG-9200/ 9700 multiple patient receiver.

Set the detection sensitivity in respiration measurement.
When respiration counting is incorrect because the respiration waveform is too large or small, change the detection sensitivity.

- For too large respiration waveform: Select smaller sensitivity
- For too small respiration waveform: Select larger sensitivity

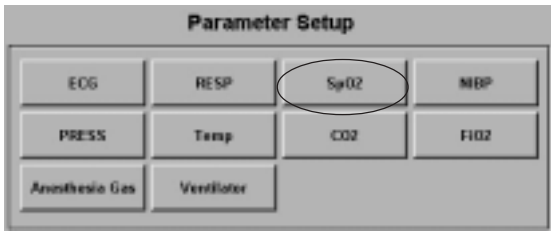
1. Touch “Resp Sens” to open the setting window.

2. Touch the key for the desired sensitivity in “Resp Sens”. (The factory default setting is ×1)



SpO_2 Settings

On the Menu screen, touch "SpO_2". The SpO_2 window opens.



Setting the Vital Sign Alarm

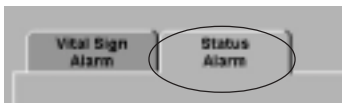
Set each SpO_2 alarm upper/lower limits. The setting procedure is the same as on the Vital Sign Alarm window of the Personal Setup. Refer to Section 6.

Turning the SpO_2 Status Alarm ON/OFF

NOTE

The SpO_2 status alarm can be set only while measuring SpO_2.

Set the SpO_2 status alarm on or off. When this alarm is set to ON and an alarm such as "Searching Pulse" occurs during SpO_2 measurement, there is an alarm sound (continuous bong). The factory default setting is ON.



1. Touch "Status Alarm" to open the setting window.

2. Touch "ON" or "OFF".

NIBP Settings

On the Menu screen, touch “NIBP”. The NIBP window opens.

Setting the Vital Sign Alarm

Set each NIBP alarm upper/lower limits. The setting procedure is the same as on the Vital Sign Alarm window of the Personal Setup. Refer to Section 6.

Setting NIBP Measurement Mode and Measurement Interval

WARNING

When performing long term measurements at intervals less than 2.5 minutes, periodically check the state of the patient, blood vessels and limb for adequate circulation. Congestion may occur at the measurement site.

When performing periodic measurements for a long term, periodically check the circulation condition.

1. Touch “NIBP” to open the setting window.

2. Set the measurement interval.

   Manual: Perform single measurement.

   STAT: Continuously repeat measurements for 15 minutes.

   (Specific interval): Intervals selectable at the bedside monitor appear in "Measurement Interval". Perform measurements at the selected interval. You can also start NIBP measurement manually by touching "START" on the NIBP measurement window of the NIBP window.

   Touch the desired interval. Measurements are automatically performed at the selected interval.

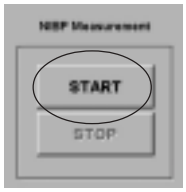
Starting/Stopping NIBP Measurement

CAUTION

Before you remotely start and stop NIBP measurement from the central monitor, confirm the state of the patient at the bedside monitor. Carefully start and stop NIBP measurement from the central monitor.

To start NIBP measurement,

1. Touch "NIBP Measurement".



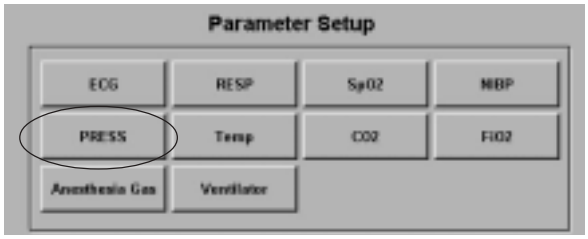
2. Touch "START" at NIBP Measurement. A window to confirm the measurement start appears.

3. Touch "Yes" to start measurement. Touch "No" to cancel starting measurement.

To stop NIBP measurement, touch "STOP" at NIBP Measurement. When measurement interval is set, measurement continues at the preset interval until "STOP" is touched.

PRESS Settings

On the Menu screen, touch “PRESS”. The PRESS window opens.



Setting the Vital Sign Alarm

Set each PRESS alarm upper/lower limits. The setting procedure is the same as on the Vital Sign Alarm window of the Personal Setup. Refer to Section 6.

Changing the Display Pattern and the Blood Pressure Label

NOTE

Blood pressure label setting is only available for beds connected via the ORG-9200/9700 multiple patient receiver. Display pattern can be set at any beds.

You can change the display pattern of the blood pressure measurement value and the label of the blood pressure measurement site.

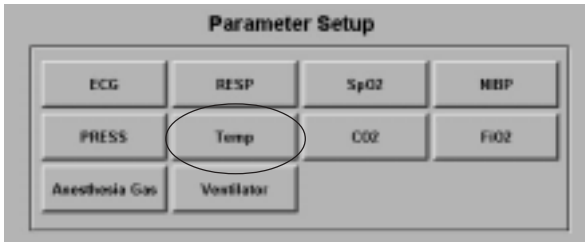
1. Touch “Label/Disp.” The setting window opens.

2. After you touch the key for the display pattern or label name you want to change, touch one of the “Select Display Pattern” keys.
   Selectable display patterns are:
   S/D/M: systolic/diastolic/mean
   Mean

   Selectable labels are:
   ART: Arterial Pressure
   You can set up to 2 lines (ART, ART-2).
   RAD: Radial Artery Pressure
   DORS: Dorsal Artery Pressure
   AO: Aortic Pressure
   FEM: Femoral Artery Pressure
   UA: Umbilical Artery Pressure
   UV: Umbilical Vein Pressure
   PAP: Pulmonary Artery Pressure
   CVP: Central Venous Pressure
   RAP: Right Atrial Pressure
   RVP: Right Ventricular Pressure
   LAP: Left Atrial Pressure
   LVP: Left Ventricular Pressure
   PRESS: Others
   You can set up to 8 lines (PRESS, PRESS-2 to PRESS-8)
   ICP: Intracranial Pressure
   You can set up to 4 lines (ICP, ICP-2 to ICP-4)

Temp Settings

On the Menu screen, touch “Temp”. The Temp window opens.



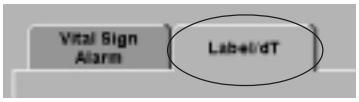
Setting the Vital Sign Alarm

Set each Temp alarm upper/lower limits. The setting procedure is the same as on the Vital Sign Alarm window of the Personal Setup. Refer to Section 6.

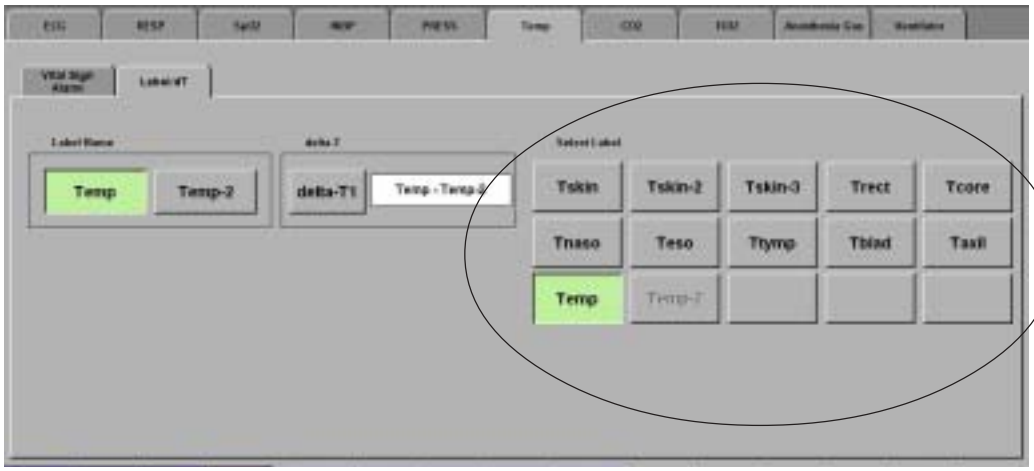
Setting the Label for Temperature Measurement and Equation for ΔT

You can set the label for the temperature measurement site and the equation for ΔT.

1. Touch “Label/dT” to open the setting window.

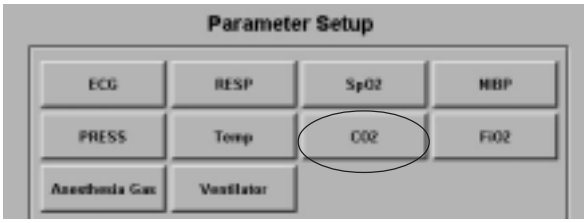


2. After you touch the key for the label name or equation for ΔT you want to change, touch one of the “Select Label” keys.
   Selectable labels are:
   Tskin: Skin temperature
   Up to 3 sites can be set. (Tskin, Tskin-2, Tskin-3)
   Trect: Rectum temperature
   Tcore: Core temperature
   Tnaso: Nasal cavity temperature
   Teso: Esophagus temperature
   Ttymp: Tympanic membrane temperature
   Tblad: Bladder temperature
   Taxil: Axillary temperature
   Temp, Temp-2 to 8: Others


Temp
Temp-2
delta-T1
Tskin
Tskin-2
Tskin-3
Trect
Tcore
Tnaso
Teso
Ttymp
Tblad
Taxil
Temp

CO_2 Settings

On the Menu screen, touch “CO2”. The CO2 window opens.

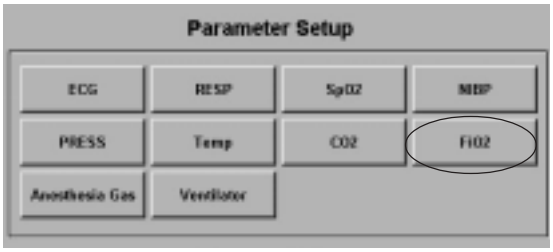


Setting the Vital Sign Alarm

Set each CO2 alarm upper/lower limits. The setting procedure is the same as on the Vital Sign Alarm window of the Personal Setup. Refer to Section 6.

FiO_2 Settings

On the Menu screen, touch “FiO2”. The FiO2 window opens.

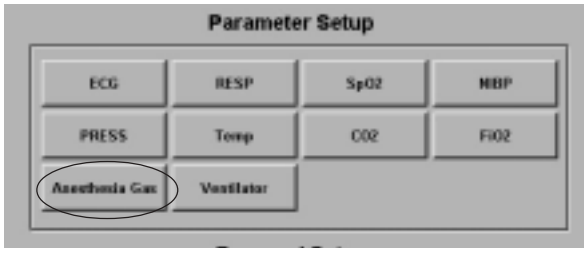


Setting the Vital Sign Alarm

Set each FiO2 alarm upper/lower limits. The setting procedure is the same as on the Vital Sign Alarm window of the Personal Setup. Refer to Section 6.

Anesthesia Gas Settings

On the Menu screen, touch “Anesthesia Gas”. The Anesthesia Gas window opens.



Setting the Vital Sign Alarm

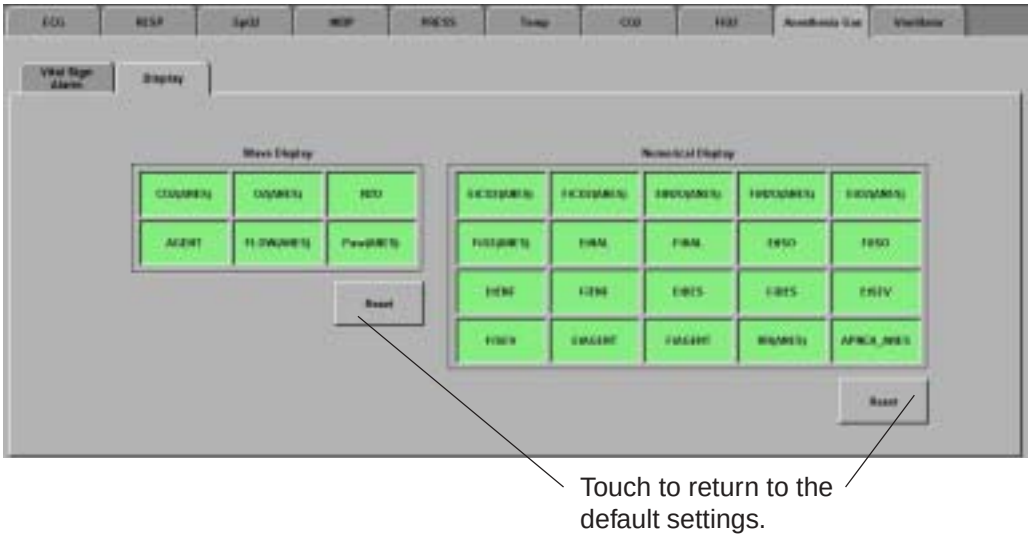
Set each Anesthesia Gas alarm upper/lower limits. The setting procedure is the same as on the Vital Sign Alarm window of the Personal Setup. Refer to Section 6.

NOTE

Alarms at the external instrument such as ventilator multigas etc. can not be set at the central monitor.

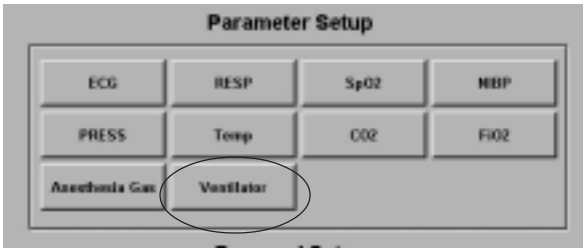
Setting the Displayed Parameters of Waveforms and Numerical Data

Every touch of a key in “Wave Display” and “Numerical Display” toggles it between selected and unselected.



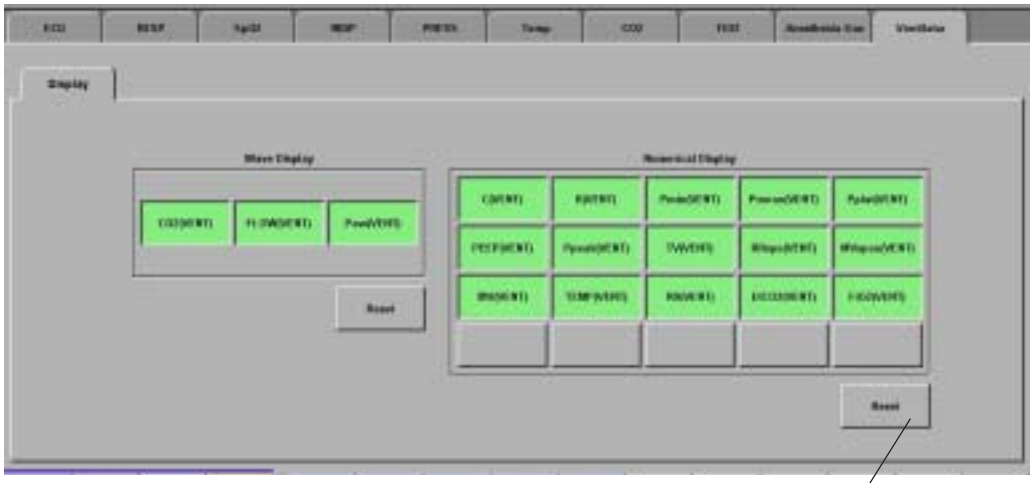
Ventilator Settings

On the Menu screen, touch “Ventilator”. The Ventilator window opens.



Set displayed parameters of waveforms and numeric data.
Perform this setting when you limit the ventilator parameters on the All Beds screen and Individual Bed screen. Only the parameters you set in this “Parameter Setup” are displayed.

Every touch of key in “Wave Display” and “Numerical Display” toggles between selected and unselected.



Touch to return to the default settings.

Section 13 Personal Setup and Setup

Overview of Personal Setup and Setup 13.1
Displaying Each Setting Window 13.1

Overview of Personal Setup and Setup

Personal Setup and Setup have the following settings for each bed.

	Item	Description
Personal Setup	Admit/Discharge	Patient admission and discharge, Temporary discharge, Patient transfer
	Vital Sign Alarm	Setting vital sign alarms
	Arrhythmia Alarm	Setting arrhythmia alarms
	ST Alarm	Setting ST alarms
	Alarm Master Display	Setting alarms using alarm masters
Setup	Recording	Setting recording
	Channel	Setting receiving channel
	Other Settings	Turning signal loss alarm ON/OFF

For details of each setting, refer to the following sections.

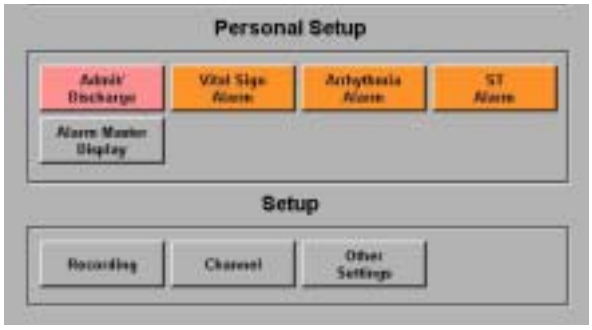
Admit/Discharge: Refer to Section 5.
Vital Sign Alarm: Refer to Section 6.
Arrhythmia Alarm : Refer to Section 6.
ST Alarm: Refer to Section 6.
Alarm Master Display: Refer to Section 6.
Recording: Refer to Section 10.
Channel: Refer to Section 5.
Other: Refer to Section 6.

Displaying Each Setting Window

1. Touch the basic information area of the bed you want to set the settings for.

2. Touch “Menu” to display the Menu screen.

3. In “Personal Setup” or “Setup”, touch the key of the desired setting. The setting window opens.



Section 14 Error Messages and Troubleshooting

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Troubleshooting

System

Trouble	Possible Cause/Criteria	Action
The touch screen keys do not function.	The pressed position and activated position do not match.	Reboot the display with the following procedure. 1. Confirm the cable connection for the touch screen. 2. Turn off the LCD display and then turn it on again. 3. Perform touch screen initialization and calibration at the Touchscreen Setting window of the System Setup. If the trouble remains after actions 1 to 3, exit the central monitor program and restart Windows 2000.
The mouse disappears off the screen.	The central monitor is operated in dual display mode.	To stop dual display mode, do the following: 1. On the Monitor Setting window of the System Setup, set “Number of Displays” to Single Display. 2. On the Display Properties window of Windows 2000, set “Display2” to OFF, then reboot the system.
The “System Setup” key cannot be touched.	The central monitor is operated in dual display mode and the System Setup screen is open at the other display.	
Display position is not correct.	The screen is out of synchronization.	VL-971R/RK LCD unit: Set the correct screen frequency using the smart synchronization function. Locally purchased LCD unit: Select the correct screen frequency referring to the LCD unit operation manual.
No display on the second display	Settings on the Display Properties window of Windows 2000 are not set properly.	On the Display Properties window of Windows 2000, set “Display2” to ON, then reboot the system. (When the product is shipped, this setting is set to OFF.)
An application error occurs when you start the central monitor system program and the system does not start.		Confirm that the Display Properties window of Windows 2000 is set as below. When the central monitor is operated in the dual display mode, confirm both display 1 and 2. Screen Area: 1280 × 1024 Colors: True color On the Windows setting window, set display 1 to the left and 2 to the right.
Cannot display data saved in the NFS-9000 network file server.	---	At present, the CNS-9701 central monitor cannot display data saved in the NFS-9000 network file server.
Data is deleted when the central monitor power is turned off.	Faulty hard disk	Contact your Nihon Kohden distributor or representative. The central monitor may lose its function as a monitor.
The system crashes when trying to review the past data.		
The system crashes periodically such as once a day.		

Trouble	Possible Cause/Criteria	Action
Incorrect date and time	Clock error	Contact your Nihon Kohden distributor or representative.
	If the clock becomes incorrect after adjusting the clock and turning the central monitor power on again, the back up battery is weak.	
• Slow operation • It takes time to read out the saved data. • Malfunction	Windows is unstable.	Shut down the central monitor system program and restart it. For a stable operation, restart the central monitor system program once every three months.

Network

Trouble	Possible Cause/Criteria	Action
A desired bed is not displayed in the selected group.	The bedside monitor or multiple patient receiver for that bed is turned off.	Turn on the bedside monitor or multiple patient receiver.
	The desired bed belongs to another group.	On the Monitor Setting window, check other groups to find the desired bed. Check group names of each bedside monitor and multiple patient receiver.
Cannot find 8000 series beds in the network	---	8000 series beds connected to the network via the CNS-9301/9302 central monitor belong to the same group as the CNS-9301/9302 central monitor.

Measurement Value

Trouble	Possible Cause/Criteria	Action
Heart rate is not counted correctly.	Waveform too large or too small	Adjust the QRS detection sensitivity.
	QRS detection threshold is changed.	
	QRS and pacemaker spikes are not distinguished.	Turn pacing detection ON.
	QRS detection is set to “Manual”.	Set QRS detection to “Auto”, or confirm that the QRS detection lead and threshold in manual detection are set properly.
Arrhythmia is not measured correctly.	ECG learning is not correct.	Relearn patient’s ECG.
Heart rate and arrhythmia are not measured correctly.	ECG lead that is inappropriate for analysis is selected.	Change the ECG lead used for analysis.
Noise on the ECG waveform	Hum interference on the ECG waveform.	Set the hum filter to ON.
The ST value is inaccurate.	The ST analysis point is not set properly.	Confirm that the ST analysis point setting is properly set for ST analysis.
Respiration is not measured correctly.	Waveform too large or too small	Set the proper sensitivity.
	Respiration sensitivity is changed.	
	Respiration measurement is set to OFF.	Turn the respiration measurement ON.

Alarm

Trouble	Possible Cause/Criteria	Action
No alarm.	Each alarm setting of the Personal Setup is set to OFF.	Turn the alarms ON for the bed.
	Arrhythmia analysis is turned OFF at the bedside monitor and/or central monitor.	Turn arrhythmia analysis ON on both the bedside monitor and central monitor.
	All alarms are set to OFF at the bedside monitor.	Turn all alarms ON at the bedside monitor. This operation cannot be done at the central monitor.
All alarms for a bed cannot be turned ON/OFF together.	---	This operation is not available at the central monitor.

Admitting/Discharging

Trouble	Possible Cause/Criteria	Action
Cannot transfer a patient.	You are trying to do this operation on the central monitor where the bed's data is not saved.	Do this on the central monitor where the bed's data is saved.
Cannot change the receiving channel.		
Cannot admit/discharge a patient.	You are trying to do this operation on the central monitor where the bed's data is not saved.	Do this on the central monitor where the bed's data is saved.
	The bedside monitor is turned off.	Turn on the bedside monitor.
Cannot select a bedside monitor as a transfer destination bedside monitor.	The bedside monitor is turned off.	Turn on the bedside monitor.
The patient's data before a certain time is lost.	The patient was transferred to a different bed more than once.	When a patient is transferred more than once, the data from before the transfer before the previous transfer is lost.
The patient's data before patient transfer cannot be reviewed.	The central monitor where the patient's data is saved is turned off.	Turn on the central monitor where the bed's data before the patient transfer is saved.
The patient data transfer is not completed when the message "Transferring" is displayed on the screen.	During patient transfer, the central monitor was turned off. Or, there was trouble on the network and the transfer failed.	Admit the patient at the destination bedside monitor. The lost data cannot be restored.
All patient's data is lost after patient transfer.		
ST recall data is lost after patient transfer.	You transferred a 8000 series bed that was a monitored bed of a CNS-9301/9302 central monitor.	You cannot transfer ST recall data of an 8000 series bed that was a monitored bed of a CNS-9301/9302 central monitor.

All Beds Screen/ Individual Bed Screen

Trouble	Possible Cause/Criteria	Action
Numeric data and messages disappear for a moment.	The display is refreshed. This is normal.	---
Waveform is not displayed.	The bed is discharged.	Admit the patient.
	The bed is set to temporary discharge.	Resume monitoring.
	The bedside monitor or the multiple patient receiver is turned off.	Turn on the bedside monitor or the multiple patient receiver.
	The currently measured lead/label is different from the lead/label to be displayed on the screen.	Confirm the setting so that the currently measured lead/label matches the lead/label to be displayed on the screen.
	The waveform is not selected as the displayed waveform.	Set the waveform to the displayed waveform.
	The bed is not registered as a monitored bed.	Register the bed to the monitored bed.
	Network is disconnected.	Confirm the network connection.
	The bedside monitor is an 8000 series bed connected to the network via the CNS-9301/9302 central monitor.	Several types of waveforms cannot be displayed on 8000 series bedside monitors.
Numeric data is not displayed.	The parameter of the numeric data is not selected as the displayed parameter.	Set the parameter of the numeric data to the displayed parameter.
	The label of the currently measured numeric data is different from the label to be displayed.	Confirm the setting so that the label of the currently measured numeric data matches the label to be displayed.
	A vital alarm occurred in a parameter that is not set to a displayed parameter and its numeric data took the place of a numeric data that is set to the displayed parameter.	The numeric data of a parameter whose vital alarm is currently occurring has a higher priority to be displayed.
The desired waveform or numeric data cannot be selected.	The waveform or numeric data is not measured.	Measure the waveform or numeric data.
		Confirm the setting so that the currently measured lead/label matches the lead/label to be displayed on the screen.
		Register the desired parameter on the Parameters window of the System Setup. A parameter registered at the Parameters window of the System Setup is displayed on setting keys even when it is not currently measured.
Some waveforms are not displayed.	Some of the patient waveforms cannot be displayed on this central monitor while another central monitor that is connected to a multiple patient receiver or a signal exchanger displays the individual bed screen of the patient.	Display the All Beds screen at the central monitor where the patient's data is saved.
The desired parameter cannot be displayed.	The parameter is a parameter that cannot be displayed.	Refer to Section 15 "Parameter Priority" for the list of parameters that can be displayed on the central monitor.
Cannot find a key to freeze a waveform or relearn ECG.	Those functions are not assigned to function keys.	Assign these functions to function keys.

Trend Window

Trouble	Possible Cause/Criteria	Action
Trend data is not displayed.	The central monitor where the bed's data is saved is turned off.	Turn on the central monitor where the bed's data is saved.
Trend data is not saved.	The central monitor where the bed's data is saved was turned off during measurement.	Trend data is not created when the central monitor where the bed's data is saved is turned off.

Tabular Trend Window

Trouble	Possible Cause/Criteria	Action
Tabular trend data is not displayed.	The central monitor where the bed's data is saved is turned off.	Turn on the central monitor where the bed's data is saved.
Cannot select a parameter you want to add to the tabular trend	The parameter is not registered at the Parameters window of the System Setup.	Register the parameter at the Parameters window of the System Setup.
NIBP numeric data is not displayed.	When an NIBP measurement is delayed or remeasured and its measurement timing does not match the selected tabular trend interval, that NIBP data will not appear on the tabular trend.	Set the tabular trend display interval to 1 min. The NIBP tabular trend and all NIBP measurements are displayed.
Tabular trend data is not saved.	The central monitor where the bed's data is saved was turned off during measurement.	Tabular trend data is not created when the central monitor where the bed's data is saved is turned off.

Hemodynamics List Window

Trouble	Possible Cause/Criteria	Action
Hemodynamics data is not displayed.	The central monitor where the bed's data is saved is turned off.	Turn on the central monitor where the bed's data is saved.
Hemodynamics data is not saved.	The central monitor where the bed's data is saved was turned off during measurement.	Hemodynamics data is not created when the central monitor where the bed's data is saved is turned off.
	The bedside monitor cannot output hemodynamics data to the network.	Hemodynamics data that can be reviewed at the central monitor is data created at the BSM-4100 series bedside monitor version 02-09 or later.

Arrhythmia Recall Window

Trouble	Possible Cause/Criteria	Action
Arrhythmia recall files are not created.	The arrhythmia analysis is set to OFF.	Turn the arrhythmia analysis to ON.
Arrhythmia recall files for a particular arrhythmia are not created	Recall file creation for the arrhythmia is set to OFF.	Turn the setting to ON.
Arrhythmia recall files for unnecessary arrhythmias are created.	Recall file creation for the arrhythmia is set to ON.	Turn the setting to OFF.
Arrhythmia recall files are deleted.	The number of arrhythmia recall files for one bed exceeded the limit and older files are deleted.	Deleted files cannot be recovered.
	You touch “Delete” when several files have a deletion mark.	
Arrhythmia recall files are not displayed.	The bedside monitor is turned off.	Turn the bedside monitor or multiple patient receiver on.
	The central monitor where the bed’s data is saved is turned off.	Turn on the central monitor where the bed’s data is saved.
	The arrhythmia types to be displayed on the screen are not selected.	Select the arrhythmias to be displayed on the screen.
Arrhythmia recall files are not saved.	The central monitor where the bed’s data is saved was turned off during measurement.	Arrhythmia recall files are not created when the central monitor where the bed’s data is saved is turned off.
When the multi waveform display is selected, the desired waveforms cannot be displayed.	Stored waveforms and displayed waveforms are not selected for full disclosure waveform.	Waveforms displayed for the multi waveform display are synchronized with the displayed waveform settings on the Full Disclosure window. Set at “Stored Waves” and “Displayed Waves” on the Full Disclosure window.
Multi waveform cannot be displayed.	The QP-973P Full Disclosure Filing Program Kit is not installed.	Install the QP-973P Full Disclosure Filing Program Kit.

ST Recall Window

Trouble	Possible Cause/Criteria	Action
ST recall files for 72 hours cannot be saved.	The interval of ST recall file creation is set to 30 seconds.	With the creation interval of 30 seconds, the total number of files exceeds the limit. To save recall file for 72 hours, set the creation interval to 1 min or more.
ST recall files are not saved.	The central monitor where the bed’s data is saved is turned off.	Turn on the central monitor where the bed’s data is saved.
	The bedside monitor cannot output ST recall files to a network.	The central monitor cannot save or display ST recall files of the following bedside monitors: • BSM-4100 series bedside monitor whose version is not 02-09 or later • 8000 series bed that is a monitored bed of a CNS-9301/9302 central monitor.

Full Disclosure Window

Trouble	Possible Cause/Criteria	Action
Full disclosure waveform is not displayed.	The central monitor where the bed's data is saved is turned off.	Turn on the central monitor where the bed's data is saved.
	The QP-973P Full Disclosure Filing Program Kit is not installed.	Install the QP-973P Full Disclosure Filing Program Kit.
	The QP-973P Full Disclosure Filing Program Kit is not installed in the central monitor where the bed's data is saved.	Choose a central monitor with the QP-973P Full Disclosure Filing Program Kit installed for the central monitor where the bed's data is saved.
The desired full disclosure waveform is not displayed.	The full disclosure waveform is not saved.	Choose the waveform for the stored waveform on the Full Disclosure window.
The desired waveform cannot be selected for a stored waveform.	The parameter is not measured.	Measure the parameter.
	This central monitor is not the central monitor where the bed's data is saved.	This setting is only available at the central monitor where the bed's data is saved or the BSS-9800 bedside station (central mode).
The waveforms that are selected for the stored waveform are not saved.	The central monitor where the bed's data is saved was turned off during measurement.	Full disclosure waveform is not saved when the central monitor where the bed's data is saved is turned off.
	The currently measured lead/label is different from the lead/label to be saved.	Make the currently measured lead/label match the lead/label to be saved.
On the Full Disclosure window, the arrhythmia waveform is not indicated with the preset color.	Arrhythmia analysis is set to OFF at the bedside monitor and/or the central monitor.	Turn arrhythmia analysis to ON at the bedside monitor and central monitor. You cannot set color to an arrhythmia that does not have color.
	The arrhythmia alarm is set to OFF at the bedside monitor and/or the central monitor.	Turn the arrhythmia alarm to ON at the bedside monitor and central monitor. You cannot set color to an arrhythmia that does not have color.
	Noise interference Poor electrode attachment condition	You cannot set color to an arrhythmia that does not have color.

ECG 12 Lead Analysis Window

Trouble	Possible Cause/Criteria	Action
ECG 12 Lead analysis files are not displayed.	The QP-974P 12 Lead ECG Interpretation Filing Program Kit is not installed.	Install the QP-974P 12 Lead ECG Interpretation Filing Program Kit.
	The bedside monitor cannot output ECG 12 lead analysis files to a network.	The central monitor can display ECG 12 lead analysis files of the BSM-4100 series bedside monitor only when the bedside monitor version is 03-02 or later.

Report Window

Trouble	Possible Cause/Criteria	Action
Report printing starts automatically.	The report printing mode is set to “Auto”.	Set the mode to “Manual”.

Recording

Trouble	Possible Cause/Criteria	Action
In the following recordings, waveforms that you do not want to record are recorded. - Manual recording - Periodic recording - Alarm recording - Call recording	Waveforms displayed on the All Beds screen are recorded.	---
In the following recording, waveforms that you do not want to record are recorded. - Dual waveform recording	Recorded waveform is not selected on the Recording window of the Setup.	Select the desired waveform on the Recording window of the Setup.
In the following recording, waveforms that you do not want to record are recorded. - Remote delayed waveform recording	Recorded waveform is selected at the bedside monitor.	---
Alarm recording is not performed for a particular arrhythmia.	Recall file creation for the arrhythmia is set to OFF.	Turn the setting to ON.
Vital sign alarm recording is not performed.	Vital sign alarm recording is set to OFF.	Set vital sign alarm recording to ON.
Arrhythmia alarm recording is not performed.	Arrhythmia alarm recording is set to OFF.	Set arrhythmia alarm recording to ON.
	Arrhythmia analysis is set to OFF at the bedside monitor.	Turn arrhythmia analysis to ON at the bedside monitor.
ST alarm recording is not performed.	ST alarm recording is set to OFF.	Set ST alarm recording to ON.
Periodic recording is not performed.	Periodic recording is set to OFF on the Recording window of the Setup.	Set periodic recording to ON.
Call recording is not performed.	Call recording is set to OFF on the Recording window of the Setup.	Set call recording to ON.
Trend data are not printed for the report printing.	Report settings are not correct.	Set the correct settings on the Report window.
Dual waveform recording is not performed. (Only one waveform is recorded/printed.)	On the Recording window of the Setup, “Second Wave” at “Recording Pattern” is set to NONE.	Set a desired waveform for “Second Wave” at “Recording Pattern”.
Waveform is not printed on the screen copy.	Waveform cannot be printed on the screen copy.	---

Overview Bed Screen

Trouble	Possible Cause/Criteria	Action
Some waveforms are not displayed.	When the individual bed screen of a patient is displayed on a central monitor that is connected to a multiple patient receiver or a signal exchanger, some of the patient waveforms cannot be displayed on the Overview Bed of another central monitor.	Display the All Beds screen at the central monitor that saves the data of the bedside monitor you want to display.
The desired bed cannot be selected for the Overview Bed screen.	The bed is an 8000 series bed.	To display data of an 8000 series bed on this central monitor, a central monitor on the network must be monitoring the bed.
The alarm for the overview bed does not occur.	No bedside monitor is selected at the Overview Bed screen.	Select a desired bed as an overview bed.
Cannot silence an overview bed alarm.	An overview bed alarm cannot be silenced at the central monitor.	To stop overview bed alarm, stop monitoring any overview bed by touching “Stop monitoring” on the Overview Bed Menu screen.
An overview bed alarm of an unintended bed occurs.		

Parameter Setup

Trouble	Possible Cause/Criteria	Action
Available settings differ among bedside monitors.	Available settings depend on the bedside monitor model and connection method.	---

Error Messages

Error messages are categorized into two types, messages sent from bedside monitors/multiple patient receiver and messages generated at the central monitor.

Messages From Bedside Monitors/Multiple Patient Receiver

Messages about Measurement Conditions of Each Parameter

The central monitor receives error messages from bedside monitors and multiple patient receiver and displays them on the screen. Here is the message list. For causes and countermeasures for each message, refer to the bedside monitor/ multiple patient receiver operator's manual.

Some messages displayed at the bedside monitor/multiple patient receiver are not displayed on the central monitor.

Parameter	Message
ECG	CHECK LEADS
	CHG ELECTRODE
	NOISE
	SMALL QRS
	RHYTHM CHG
	LEARNING
	LOW mV
	HIGH mV
	AUTO LEAD CHG
	CANNOT ANALYZE
	PACING

Parameter	Message
Arrhythmia	ASYSTOLE
	V.FIB
	Vf/VT
	EXT.TACHY
	EXT.BRADY
	V.TACHY
	VPC RUN
	COUPLET
	EARLY VPC
	MULTIFORM
	BIGEMINY
	FREQ.VPC
	TACHYCARDIA
	BRADYCARDIA
	PROLONGED RR
	FREQ.SVPC
	NON-FUNCTION
	NON-CAPTURE
	PACE FAILURE
	IRREGULAR RR
	VPC
	SVPC
	RHYTHM CHG
	NEW FORM
	NEW NORMAL BEAT

Parameter	Message
SpO_2	Module Failure
	Too Many Params
	Connector Off
	Probe Off
	Probe Disconnect
	Probe Broken
	No Pulse
	Light Interfer.
	Pulse Search
	Check Probe Site
	M (Unstable Pulse)
	Small Pulse
	Check Label
	Probe Off
	Probe Broken
	Hardware Control
	Noise
	Cal Start
	Cal Complete

Parameter	Message
RESP	Module Failure
	Too Many Params
	Connector Off
	Check Sensor
	Check Label
	Power Off
	Resp Off

Parameter	Message
NIBP	Module Failure
	Too Many Params
	Connector Off
	Safety Valve Open
	No pulse
	Meas Time Out
	Check Cuff/Hose
	Systolic Over
	High Cuff Pressure
	Re-measuring
	Please Wait
	Small Pulse
	Zeroing
	Noise
	Check Sensor
	Cannot Measure
	Check Cuff/Hose

Parameter	Message
PRESS	Module Failure
	Too Many Params
	Check Label
	Connector Off
	Check Sensor
	Out of Range
	Zero Imbalance
	Zero Unstable
	Zero Out of Range
	Zeroing Complete
	Noise

Parameter	Message
Temp	Module Failure
	Too Many Params
	Check Label
	Connector Off
	Check Sensor

Parameter	Message
CO_2	Module Failure
	Too Many Params
	Check Label
	Connector Off
	Check Sensor
	Line Block

Parameter	Message
FiO_2	Module Failure
	Too Many Params
	Check Label
	Connector Off
	Check Sensor
	Sensor Run Down?
	Cal?
	Calibration Error
	Calibrating

Parameter	Message
FLOW	Module Failure
	Too Many Params
	Check Label
	Connector Off
	Check Sensor
	Change Sensor
	Calibrating

Parameter	Message
$S\bar{v}O_2$	Module Failure
	Too Many Params
	Check Label
	OM2 Disconnected
	Check OM2
	OM2 Failure
	Check OM2 Light
	OM2 Error
	Out of Range
	Auto Zero
	Calibration Error

Parameter	Message
CCO	Unit Failure
	Too Many Params
	Check Label
	Connector Off
	Check Catheter
	Catheter Location
	Meas Failure
	Com Error
	Alarm
	Standby
	Tb Out of Range
	Unstable Tb
	Signal Adapting
	CO<1.0L/m

Parameter	Message
ANES	Unit Failure
	Too Many Params
	Check Label
	Illegal Module
	SAM Failure
	Moisture Detected
	Over Temp
	SAM Not Installed
	Com Error
	GAS Liquefied
	Check Sampl Line
	Blocked Sampl Line
	Install Aquaknot
	Remove Aquaknot
	Alarm
	Check
	Sensor Failure
	O2 Sensor Failure
	Calibrating(Zero)
	Warming Up
	DES??
	Standby
	Calibrating
	Calibration Error
	Apnea

Parameter	Message
$tcPO_2/tcPCO_2$	Module Failure
	Com Error
	Alarm
	ConnectorOff

Parameter	Message
BIS	Module Failure
	Too Many Params
	Check Label
	Connector Off
	Check Sensor
	DSC Failure
	Com Error
	Alarm
	Imp. Checking
	High Impedance

Parameter	Message
CNIBP	Unit Failure
	Connector Off
	Check Sensor
	Com Error
	Pulse Search
	Sensor Expired
	Check
	Out of Range

Parameter	Message
EEG	Module Failure
	Too Many Params
	Check Label
	Connector Off
	Check Sensor
	Alarm

Parameter	Message
VENT	Alarm

Other

Trouble	Possible Cause/Criteria	Action
SIGNAL LOSS	Weak electric field strength of a wireless telemeter.	Check the followings: • Remaining charge of the transmitter battery • Transmitter antenna lead condition • Distance between the multiple patient receiver and transmitter
BATTERY	Weak transmitter battery	Replace the batteries with new ones.
CALL	The CALL button on the transmitter was pressed.	---
MONITOR OFF	The selected bedside monitor power is OFF or is disconnected from the network.	---
	The multiple patient receiver for the transmitter is disconnected from the network.	---
OFF	The bed is discharged.	---

SIGNAL LOSS, BATTERY and CALL are displayed only when receiving data from a transmitter.

Messages From Central Monitor

WS-971R Recorder Unit

Trouble	Possible Cause/Criteria	Action
RECORDER DOOR OPEN	The recorder unit door is not closed completely.	Close the door completely.
RECORDER OUT OF PAPER	No recording paper in the recorder unit.	Set recording paper in the recorder unit. If there is recording paper in the recorder unit and the message still appears, the paper detection sensor is malfunctioning. Clean the sensor part in the recorder unit.
RECORDER POWER OFF OR DISCONNECTED	The recorder unit is disconnected.	Connect the recorder unit.
	The recorder unit is turned OFF.	Turn the recorder unit power ON.

Laser Printer

Trouble	Possible Cause/Criteria	Action
Printer is OFF LINE	The laser printer is not registered.	Contact your Nihon Kohden distributor or representative.
Printer is OUT OF PAPER	No paper in the laser printer.	Set paper in the printer. Refer to the printer manual.
Job Error	Error in the printer.	Refer to the printer manual.
Paper tray is open	The laser printer cover is not closed completely.	Close the cover completely.

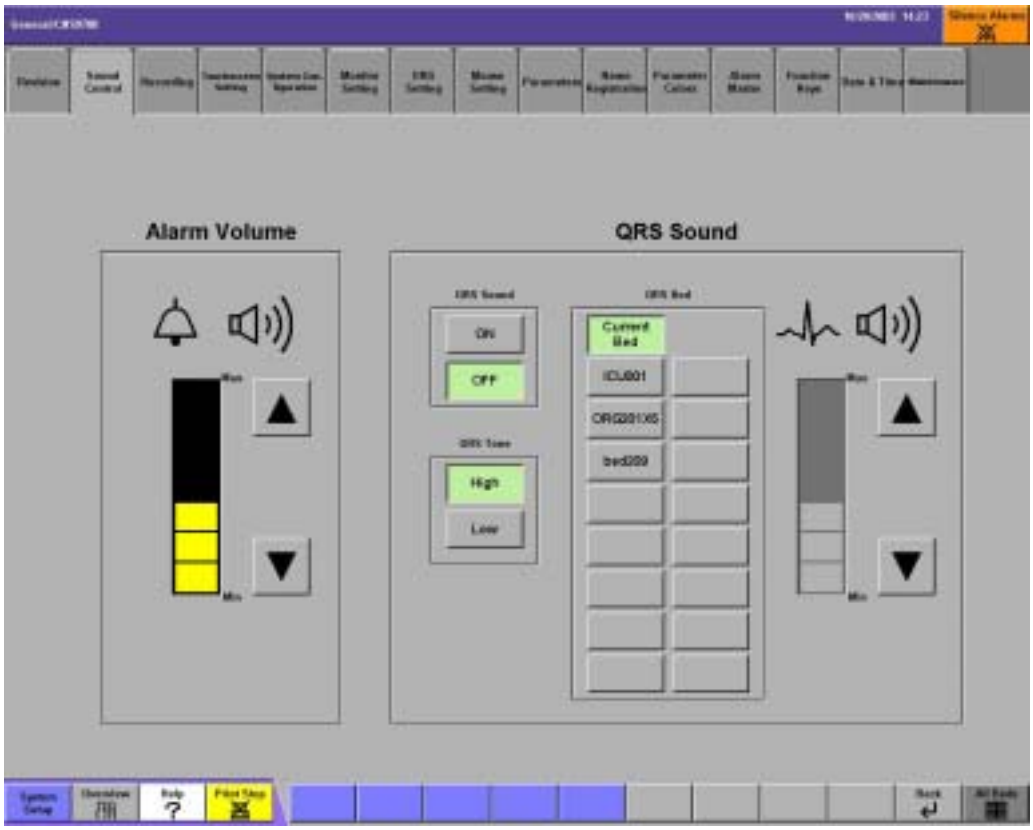
Other

Trouble	Possible Cause/Criteria	Action
OFF	The bed is discharged.	---
Temporary Discharge	The bed is temporarily discharged.	To resume monitoring, touch “Resume” on the Pause window of the Admit/Discharge of the Personal Setup.

Daily Check

Checking Sound Generation from the Speaker

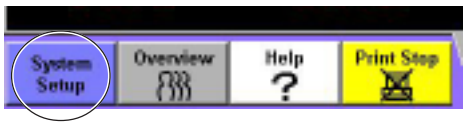
To check that there is a sound from the speaker, set alarm sound or QRS sync sound and listen to the test sound of the selected step level.



Calibrating the Touchscreen

Calibrate the touch screen when the pressed position and activated position do not match.

1. Touch “System Setup” to display the System Setup screen.



2. Touch “Touchscreen” to display the Touchscreen window

The password is displayed as ****.

3. Touch “Calibrate touchscreen” to display the setting window.

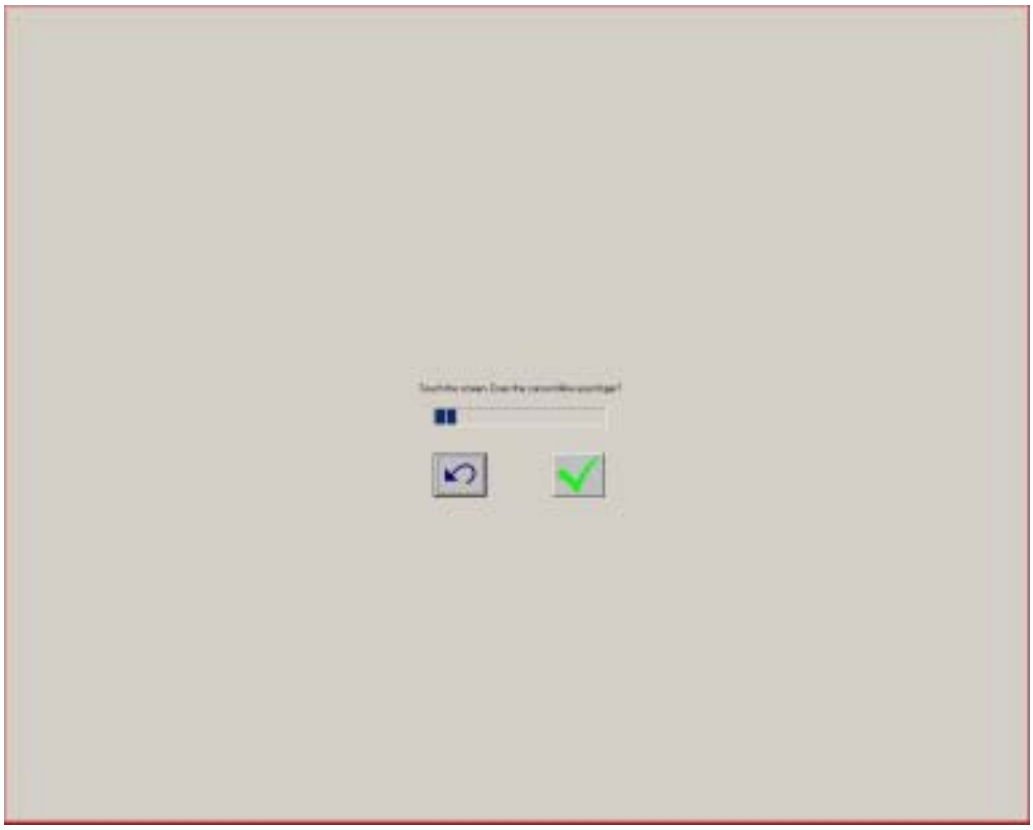
4. Touch “Calibrate touchscreen” to open the setting window.

5. Touch the exact center of the mark. Touch before the bar on the screen is finished. When the mark is correctly touched, the mark appears in another place. The mark appears in 3 places.

When all 3 places are touched correctly, the screen changes.

6. Touch “ ”. The calibration finishes and the screen returns to the Touchscreen window.

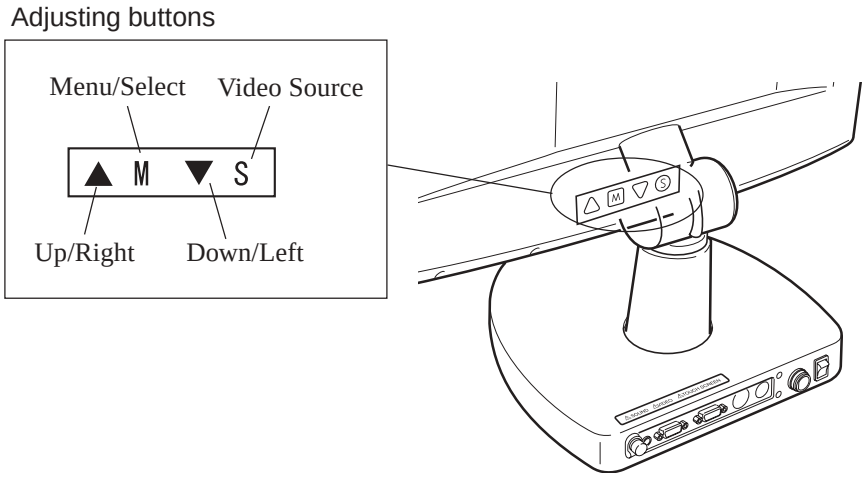
   To calibrate the touch screen again, touch “ ”.



When the calibration screen opens at a display that does not have a touchscreen function and you want to exit the calibration screen, press the Esc key on the keyboard.

Adjusting the VL-971R/RK LCD Unit

The VL-971R/RK LCD unit has the SmartSync function, which checks the input signal from the central monitor main unit and automatically adjusts the screen format. With this function, you don't need to adjust each display individually.



1. Press the S button. The adjusting window opens.

2. Confirm that the "Computer" is displayed highlighted in yellow.

3. Press the ▼ button twice. The screen is correctly formatted by the SmartSync function.

Printing a Screen Hard Copy

You can print a screen hard copy with the laser printer. Touch the "Print Screen" key on the keyboard. You can select "Enable" or "Disable"on the System Setup screen. The factory default setting is "Disable". Refer to Section 4 for enabling and disabling the screen hard copy printing.
The waveforms are not printed.

Inspection after Use

Do the following inspection after every use.

- Previous patient data is deleted.
- Temporarily changed settings are changed back to the previous settings.
- There was no abnormal performance during use.
- There is no dirt, damage or scratches on the monitor.
- The sensors, probes, transducers, and cables are cleaned and sterilized.
- Accessories are cleaned and stored properly.
- There are enough consumables, such as recording paper, and disposable electrodes for the next use.
- The power switch on the monitor is turned off.
- Dead batteries of the transmitter are disposed of properly.
- The batteries are removed from the transmitter when you are not going to use it for a while.
- The monitor is not in a wet place and there are no chemicals around the monitor.
- The monitor is stored properly.
- Medical waste is disposed of properly.

Cleaning, Disinfecting and Sterilization

CAUTION

- **Before maintenance (inspection, cleaning, disinfection), turn the central monitor power off and disconnect the power cord from the AC outlet. Otherwise the operator may receive electrical shock or the central monitor may malfunction.**
- **If any blood or bodily fluids get on the instrument or yourself, follow your hospital/organization procedure to remove it.**

Central Monitor

Cleaning the Main Unit

CAUTION

- **This instrument is not waterproof. Be careful not to let any liquid get inside the instrument.**
- **If the instrument accidentally gets wet, immediately stop using it and disconnect the power cord from the AC outlet. Contact your Nihon Kohden distributor or representative for inspection.**
- **Do not use volatile liquid such as thinner or benzene as these agents will melt or crack the materials.**

Wipe the panel with a soft cloth moistened with water, neutral soap or alcohol (76.9 to 81.4%) and wrung out. Wipe off moisture with a dry cloth or gauze and thoroughly dry before use.

Check if the vent hole is dusty. Wipe the dust off with a cotton swab or vacuum it with a cleaner.

Disinfecting the Main Unit

CAUTION

- **Do not use volatile liquids such as thinner or benzene as these agents will melt or crack the materials.**
- **This instrument is not waterproof. Be careful not to let any liquid get inside the instrument.**
- **If you put spray on the instrument, wipe the instrument off with a dry cloth after spraying.**
- **Do not sterilize. It deteriorates and damages the instrument surface and causes malfunction.**

To disinfect, wipe the main unit with a soft cloth moistened with any of the disinfectants listed below. Use the recommended concentration. Wipe off moisture

with a dry cloth or gauze and thoroughly dry before use.

Disinfectant	Concentration (%)
Glutaraldehyde solution	2.0
Hydrochloric alkyldiaminoethylglycine	0.5
Benzalkonium chloride	0.2
Benzethonium chloride solution	0.2
Chlorohexidine gluconate solution	0.5

Cleaning the Display

CAUTION

- **Be careful not to let any liquid get inside the display.**
- **Follow your hospital regulations to handle blood or bodily fluids on the display.**

NOTE

- **Do not use a dry or rough cloth.**
- **Do not use acidic, alkaline detergents or alcohol other than ethanol or isopropyl.**

Disable the touchscreen function before cleaning.

1. Touch “Menu” to display the Menu screen.
2. Touch “Touchscreen Disable” to disable the touch key function.
3. Clean the touch screen using a soft cloth which is moistened with water and neutral detergent and wrung out.

   After cleaning, click the mouse or press any key on the keyboard to restore the touchscreen function.

WS-971R Recorder Unit

Thermal Head

To protect the thermal head from abrasion or damage and assure optimum performance for a long time, clean the head surface of the recorder with the thermal head cleaning pen (recorder unit accessory) after every 7 to 10 sets of recording paper.

1. Turn off the recorder power before cleaning.
2. Push down the magazine release lever and open the magazine.
3. Clean the black part of the thermal head with the thermal head cleaning pen.

Sensor

The paper sensor is located by the thermal head. Clean the sensor surface with a dry cotton swab.

Regular Inspection

CAUTION

- **Do the regular inspection according to the specified cycle. Otherwise, deterioration and loss of function are overlooked and it results in incorrect monitoring.**
- **Replace the hard disk once every two years. If the hard disk gets damaged, monitoring is incorrect and all data saved in the central monitor is lost.**
- **Restart the central monitor once every three months. Otherwise the operation becomes unstable and monitoring may stop. During restarting, patients monitored by the central monitor must be monitored by another instrument.**

Deterioration and loss of function causes misdiagnosis. Check the following items to keep your monitor in optimal condition.

- Monitor is not dirty, damaged or rusty.
- No key or switch is broken.
- No damage to the sockets on the monitor.
- The battery cover is attached to the transmitter.
- The screw on the AC adapter cable of the VL-971R/RK LCD unit is not loose.
- Receiving antenna position is correct.
- Receiving condition in the required range.
- Channel settings are correct.
- Screen is clean and not damaged.
- Screen brightness can be adjusted.
- Screen display is correct.
- The touchscreen is properly calibrated.
- The specified recording paper is used.
- Recorder unit operates properly.
- The laser printer operates properly.
- There are sufficient consumables for the recorder/printer.
- The paper sensor works correctly.
- Enough toner in the laser printer.
- No missing dots on the recorded data.
- The date and time on the paper is correct.
- Power cord is not damaged.
- Grounding lead is properly connected.
- Supplied voltage is correct.
- The fan operates properly.
- System Setup settings are correct.
- Alarm setting is correct and functions properly.
- Date and time is correct.
- No current leakage.
- Grounding lead for UPS is properly connected.

- Alarm and sync sound can be heard clearly.
- Sound volume can be adjusted.
- Waveform display is correct. (All waveforms are properly displayed on the All Beds screen and Individual Bed screen.)
- All monitored beds are correctly recognized at the central monitor and communication in the network is in good condition.
- Review data for each bed are properly displayed on the screen.
- The touchscreen operates correctly.
- The central monitor is properly connected to external instruments.
- UPS operation is correct.
- Only the specified parts are used.
- The specified electrodes, sensors, transducers and probes are used.
- Alarm indicator lamps light.
- The central monitor is restarted once every three months.

Periodical Replacement Schedule

To maintain the performance of the instrument, the following part must be periodically replaced.

Hard disk: **once every 2 years**

Repair Parts Availability Policy

Nihon Kohden Corporation (NKC) shall stock repair parts (parts necessary to maintain the performance of the instrument) for a period of 8 years from the date of delivery. In that period NKC or its authorized agents will repair the instrument. This period may be shorter than 8 years if the board or part necessary for the faulty section is not available.

Section 15 Reference

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Factory Default Settings

All Beds Screen

Items	Setting values		Factory default setting
Sensitivity	ECG	×1/4, ×1/2, ×3/4, ×1, ×3/2, ×2, ×4	×1
	RESP	×1/4, ×1/2, ×3/4, ×1, ×3/2, ×2, ×4	×3/4
	SpO_2	×1/8, ×1/4, ×1/2, ×1, ×2, ×4, ×8	×2
	PRESS	0-20, 0-50, 0-100, 0-200, 50-200, 50-250, 0-300 (mmHg)	0-200
		0-3, 0-6, 0-12, 0-24, 6-24, 6-30, 0-36 (kPa)	0-24
	CO_2	0-20, 0-40, 0-80 (mmHg)	0-40
		0-3, 0-6, 0-12 (kPa)	0-6
	O_2	0-40, 0-100 (%)	0-40
	Paw	0-10, 0-20, 0-50, 0-100, 0-150 (cmH_2O)	0-50
	Flow	–1-+1, –2-+2, –3-+3, (L/s)	–1-+1
	Vol	0-50, 0-100, 0-500, 0-1000, 0-2000, 0-3000	0-1000
	N_2O	0-80, 0-100, 50-100 (%)	0-100
	Agent	0-4, 0-8, 0-20	0-4
	Ext	×1/8, ×1/4, ×1/2, ×1, ×2, ×4, ×8	×1
	BIS-EEG		
	EEG	10, 20, 30, 50, 70, 100, 150, 200, 300, 500, 750, 1000, 1500, 2000 (µV/cm)	100
Wave Selection	Manual (ECG II)*[1] Auto (1 wave), Auto (2 waves)*[2]		Auto (maximum number of waveforms)
Numerical Selection	Manual (HR, PRESS, PRESS-2, ART), Auto (MAX 3), Auto (MAX 6), Auto (MAX 8),		Auto (MAX 8)
Bed Color	32 colors		White
Parameter Priority	Select from all the parameters which can be displayed on this central monitor.		Refer to Section 7.

*[1]: The parameter in parentheses is a default setting in manual setting.

*[2]: Depending on the number of patients on the All Beds screen, the alternative is different in auto setting.

Individual Bed Screen

Items		Setting values		Factory default setting
Expand Individual Bed Screen	Sensitivity	Same as the All Beds screen		
	Wave Selection	Manual (ECG (II), RESP(IMP), SpO_2, PRESS, PRESS-2, ART, CVP), Auto		Auto
	Numerical Selection	Manual (HR, PRESS, PRESS-2, ART, CVP, IMP(RR), SpO_2, NIBP), Auto		Auto
	Display Setting	Sweep speed mm/s	25 or 50	25
		Respiration Wave Sweep Speed mm/s	25, 50 or 6.25	25
		BP Scale	Separate or Common	Separate
Parameter Priority		Same as the All Beds screen		

Review Window

Items			Setting values	Factory default setting
Trend	Trend Parameter Setting		Measured parameters (except for parameters that cannot be displayed on the central monitor) and registered parameters at the Parameters window of the System Setup.	Parameters that were measured when the Trend window is opened the first time after power on.
	Trend Scale		Refer to “Parameters and Dislpay” in Section 9 “Trend Window”.	
	Trend Event Setting		ASYSTOLE, V FIB, V TACHY, VPC RUN, COUPLET, Off/Noise, ALL, NONE	First: ALL Other: NONE
	Full Scale		72, 24, 8 hours, 1 hour	8 hours
Tabular Trend	Tabular Trend Parameter Setting		Measured parameters (except for parameters that cannot be displayed on the central monitor) and registered parameters at the Parameters window of the System Setup.	Parameters that were measured when the Tabular Trend window is opened the first time after the power on.
	Interval		1, 5, 10, 15, 30, 60 minutes	5 minutes
Arrhythmia Recall	Multi-wave displayed waveform		Same as those selected for the full disclosure window	
	Caliper Measurement	Zoom	×1, ×2, ×4	×1
		Sweep speed	25, 50 (mm/s)	25
	Displayed Arrhythmia		ASYSTOLE, V FIB, V TACHY, EXT TACHY, EXT BRADY, VPC RUN, COUPLET, MULTIFORM, EARLY VPC, BIGEMINY, TACHYCARDIA, BRADYCARDIA, PROLONGED RR, VPC, ALL	ALL
ST Recall	ST Sens		×1/4, ×1/2, ×3/4, ×1, ×3/2, ×2, ×4	×1
	Lead Display Position		Select from all leads	I, II, III, aVR, aVL, aVF, V1, V2, V3, V4, V5, V6, V, MCL, ECG1, ECG2
Full Disclosure	Stored Waves		Measured parameters (except for parameters that cannot be displayed on the central monitor)	ECG (Trace1), ECG (Trace2), Press, SpO_2, Resp (IMP), NONE
	Displayed Waves		Select from waveforms selected at “Stored Waves”	
	Scale		Same as those at All Beds screen and Individual Bed screen	
	Caliper Measurement	Zoom	×1, ×2, ×4	×1
		Sweep speed	25, 50 (mm/s)	25
Alarm History	Alarm Level		Crisis, Warning, Advisory, All	All
	Alarm Type		Arrhythmia, Limit, Technical, All	All
Report	Report Mode		Manual/Auto	Manual
	Report Items	Tabular Trend	Yes, No	Yes
		Graphical Trend		No
		Full Disclosure		No
	Print Time		Free setting	16:00
	Duration	Manual	5 minutes to 24 hours	8 hours
		Auto	1 to 24 hours	
	Trend	Trend Interval	1, 5, 10, 15, 30, 60 minutes, NIBP	5 minutes
		Parameter List	All parameters that can be displayed on the central monitor.	NONE

Parameter Setup

Setting Item			Setting Range	Factory Default Setting
ECG	Vital Sign Alarm		Refer to Section 6.	
	Arrhythmia Alarm		Refer to Section 6.	
	Analysis Lead		Depends on the lead that is currently measured.	
	QRS Detection Sensitivity	QRS Detection	Auto, Manual	Auto*
		QRS Detection Sensitivity	×1/4, ×1/2, ×3/4, ×1, ×3/2, ×2, ×4	×1*
		QRS Detection Threshold	I, II, III, aVR, aVL, aVF, V1 to V6, V, MCL, ECG1, ECG2	II*
	ECG Lead Name		I, II, III, aVR, aVL, aVF, V1 to V6, V, MCL, ECG1, ECG2	Lead that is currently measured.
	ST Analysis Point		Refer to Section 12 “ECG”.	
	ST Interval		30 sec, 1, 2, 5, 10, 30, 60 min	30 sec*
	Lead Off Alarm		Cont, Once, OFF	Cont*
	Noise Alarm		ON, OFF	OFF*
	Arrhythmia Analysis		ON, OFF	ON*
	Pacing Detection		ON, OFF	ON*
	Hum Filter		ON, OFF	ON*
	Pacing Marker		ON, OFF	OFF
RESP	Vital Sign Alarm		Refer to Section 6.	
	Resp Meas		ON, OFF	ON*
	Resp Sens		×1/4, ×1/2, ×3/4, ×1, ×3/2, ×2, ×4	×1*
SpO_2	Vital Sign Alarm		Refer to Section 6.	
	Status Alarm		ON, OFF	ON*
NIBP	Vital Sign Alarm		Refer to Section 6.	
	Measurement Interval		Manual, Stat, 2 , 2.5, 5, 10, 15, 30, 60 min, 2, 4, 8 hours	Manual*
PRESS	Vital Sign Alarm		Refer to Section 6.	
	Label/Disp		Refer to Section 12 “PRESS”.	Label that is currently measured.
	Display Pattern		S/D/M, M	CVP, ICP, ICP2-4: M Others: S/D/M
Temp	Vital Sign Alarm		Refer to Section 6.	
	Label		Refer to Section 12 “Temp”.	Temperature that is currently measured.
	dT		---	Temp – Temp2*
CO_2	Vital Sign Alarm		Refer to Section 6.	
FiO_2	Vital Sign Alarm		Refer to Section 6.	
Anesthesia Gas	Vital Sign Alarm		Refer to Section 6.	
	Display Setting	Waveform Display	All the parameters related to anesthesia gas which can be displayed.	All parameters selected
		Numerical Data Display		
Ventilator	Display Setting	Waveform Display	All the parameters related to ventilator which can be displayed.	All parameters selected
		Numerical Data Display		

Values marked with * depend on the settings at the bedside monitor.

Personal Setup

Refer to Section 6 for the following settings.
Vital Sign Alarm
Arrhythmia Alarm
ST Alarm
Alarm Master Display

Setup

Setting Item			Setting Range	Factory Default Setting
Recording	Alarm record	Vital sign alarm record	ON, OFF	ON
		ST alarm record	ON, OFF	ON
		Call recording	ON, OFF	ON
	Dual waveform recording		Differs from beds	
	Periodic Record Interval		OFF, 30 min, 60 min, 120 min, FREE	OFF
	Record Sweep Speed		25 mm/s, 50 mm/s	25 mm/s
Other	Signal Loss alarm		ON, OFF	ON*

Values marked with * depend on the settings at the bedside monitor.

System Setup

Setting Item			Setting Range	Factory Default Setting
Sound Control	Alarm/Volume		7 steps	3
	QRS Sound	Volume	7 steps	3
		QRS Sound	ON, OFF	OFF
		QRS Tone	High, Low	High
		QRS Bed	Specific bed(Bed name), Current Bed	Current Bed
Recording	Manual Recording		10, 20, 30, 40, 50, 60 sec, 2 min	20 sec
	Periodic Recording		10, 20, 30, 40, 50, 60 sec	20 sec
	Alarm/Call Recording		10, 20, 30, 40, 50, 60 sec	20 sec
	Darkness		1, 2, 3, 4 (Darkest)	3
System Configuration	System Configuration	Language	English	
		Temperature Unit	Celsius, Fahrenheit	Celsius
		Height Unit	cm, inch	cm
		Weight Unit	Kg, Lb	Kg
		Pressure Unit	mmHg, kPa	mmHg
		Report Cover Sheet	ON, OFF	OFF
		ECG 12 Lead Printing	6rows × 2cols, 12rows × 1col, 3rows × 4cols	6rows × 2cols
		Discharge Mode	Discharge, Delete data	Discharge
		Auto Resume After Pause	OFF, 10, 30 sec, 1, 2, 3 min	3 min
		Telemetry Silence Time	1, 2, 3, 4, 5, 10 min	3 min
		Vital Sign Alarm Off Mark	ON, OFF	ON
		Screen Timeout	OFF, 1 to 30 min	5 min
		Old NIBP Display	Dim, ---	Dim
		NIBP Effective Time	10 min, 30 min, 1 hour, 24 hours	10 min
		Patient Name Display	Normal, Large	Normal
	RS-232C Setup	Baud Rate	2400, 4800, 9600, 14400, 19200, 38400	9600
		Data Bits	7, 8	8
		Parity	None, Even, Odd	None
		Stop Bits	1, 1.5, 2	1
		Flow Control	None, XON/XOFF, Hardware, Hardware XON/XOFF	None
		Communication Mode	NK Protocol, Off	NK Protocol
Monitor Setting	Bed Name Setting		Up to 10 alphanumeric letters	
	Number of Displays		Single Display, Dual Display	Single Display
	Main Display, Second Display		16 Patients (1 Wave), 12 Patients (2 Waves), 8 Patients (2 Waves), 6 Patients (2 Waves), 4 Patients (2 Waves)	Maximum number available with the installed program kit
	All Beds Numeric Area		Normal, Wide	Normal

Setting Item			Setting Range	Factory Default Setting
ORG Setting	Group		Select from groups in the network	
	Channel		1001-6080, 7001-7997, A000-C0FE, 8001-8009	1001-6080*
	Antenna		Antenna-1, Diversity	Antenna-1*
	Mode		Normal mode, RSSI mode	Normal mode*
	Type		A, C	A*
Mouse Setting			Factory Default Setting: this central monitor is assigned to the bottom middle as the mouse controller. (When using in dual display mode, the second display is assigned to the bottom right). Other positions are “Monitoring Off”	
Parameters			All parameters that can be displayed on this central monitor	All unselected
Name Registration	Set Group Name		Select from group name registered at “Edit Group Names”.	General
	Edit Group Names		Factory Default Setting: General, CCU, CCU-1, CCU-2, ER, ICU, ICU-1, ICU-2, OR, Post CCU, Recovery, Tele-1, Tele-2, Tele-3, Tele-4, Tele-5 (up to 8 alphanumeric letters, up to 16 groups)	
	Edit Pause Location Names		Factory Default Setting: Pause1 to 12	
Parameter Colors	All parameters that can be displayed on this central monitor		32 colors. Factory default settings are: White: RESP, PRESS-5, CO2, FiO2, Flow, VOL, Paw Red: ART, ART-2, RAD, DORS, AO, FEM, UA, LVP, PRESS Blue: UV, CVP, RVP, PRESS-2, N2O Green: ECG, PRESS-7, O2, EEG1, EEG2 Yellow: PAP, RAP, LAP, ICP, ICP-2 to 4, PRESS-3 to 4 Violet: EXT1 to 4 Orange: PRESS-6, EEG (BIS) Cyan: SpO2, SpO2-2 Purple: PRESS-8	
Alarm Master			Refer to Section 6.	
Function Keys			Review, Trend, Tabular Trend, Hemodynamics List, Arrhythmia Recall, ST Recall, Full Disclosure, ECG 12 Lead Analysis, Report, Bed Screen, Wave Display, ECG 12 Lead Display, All Vital Signs, Indiv. Bed Screen Setup, All-Beds Screen Setup, Parameter Setup, ECG, RESP, SpO2, NIBP, PRESS, Temp, CO2, FiO2, Anesthesia Gas, Personal Setup, Admit/Discharge, Vital Sign Alarm, Arrhythmia Alarm, ST Alarm, Alarm Master Display, Setup, Recording, Channel, Other Settings, Freeze, NIBP Measurement, Learning ECG	Review Bed Screen Parameter Setup Personal Setup Setup
Maintenance	Password Setting		---	1234
	Other	Screen Hard Copy	Enable, Disable	Disable

* Depends on the setting of ORG-9200/9700 multiple patient receiver.

Parameter Priority

The central monitor follows the priority in automatic selection function and numeric data sorting. Followings are the priority of factory default settings.

Priority	Parameter
1	ECG
2	VPC
3	ST
4	ART
5	ART-2
6	RAD
7	DORS
8	AO
9	FEM
10	UA
11	UV
12	PAP
13	CVP
14	RAP
15	RVP
16	LAP
17	LVP
18	ICP
19	ICP-2
20	ICP-3
21	ICP-4
22	PRESS
23	PRESS-2
24	PRESS-3
25	PRESS-4
26	PRESS-5
27	PRESS-6
28	PRESS-7
29	PRESS-8
30	NIBP
31	CNIBP
32	RESP
33	SpO_2
34	SpO_2-2
35	Delta SpO_2
36	PR
37	$S\bar{v}O_2$

Priority	Parameter
38	Tskin
39	Tskin-2
40	Tkin-3
41	Trect
42	Tcore
43	Tnaso
44	Teso
45	Ttymp
46	Tblad
47	Taxil
48	Temp
49	Temp-2
50	Temp-3
51	Temp-4
52	Temp-5
53	Temp-6
54	Temp-7
55	Temp-8
56	Delta-T
57	Delta-T2
58	Delta-T3
59	Delta-T4
60	Tb
61	CCO
62	Tb(CCO)
63	$S\bar{v}O_2$(CCO)
64	CO_2
65	FiO_2
66	$tcPO_2/PCO_2$
67	FLOW
68	Paw
69	VENT
70	ANES
71	BIS
72	EXT(9000)
73	EEG1
74	EEG2

Initializing the System

Usually, this procedure is not performed. Use the following procedure to initialize the central monitor to the factory default settings.

NOTE

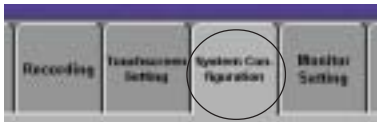
Initializing the central monitor deletes all data saved in the central monitor and returns all settings to the factory default settings. Before initialization, confirm saved data.

1. Touch “System Setup” to display the System Setup screen.

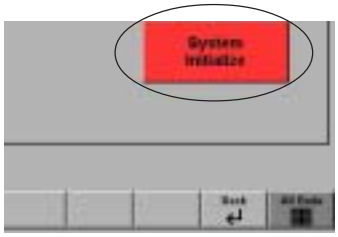
2. Enter the password.

The password is displayed as ****.

3. Touch “System Configuration” to display the System Configuration window.



4. Touch “System Initialize”. The confirmation message appears.



5. Touch “OK” to initialize the system. The system initialized and the screen of Windows 2000 appears. Double click at the icon of “CNS-9700.exe” to restart the program of the central monitor.

Specification

Display

Number of patients on the display	16 patients max With overview bed function, 16 patients plus one other patient.	
Number of transmitters	16 transmitters max	
Display type	18 inch color TFT	
Waveform display method	Non-fade, fixed method	
Number of waveform traces	Single display:	24 traces max (On the All Beds screen, displaying 12 patients)
	Dual display:	32 traces max (On the All Beds screen, displaying 16 patients)
Sweep speed	25 mm/s, 50 mm/s, 6.25 mm/s (respiration measurement)	
Sweep time	All Beds screen (8 patients):	4.48 s
	All Beds screen (4 patients):	11.56 s
	Individual Bed screen:	10.28 s

Waveform Display Items

ECG1 - 12, IBP (1- 8), respiration wave, EEG, CO_2, external input, pulse (SpO_2), Flow/Paw, anesthetic gas (O_2, CO_2, N_2O, Agent), others depending on the connected bedside monitor or transmitter

Alphanumeric Display Items

Heart rate, VPC rate, respiration rate, pulse rate, IBP (systolic, diastolic, mean), NIBP (systolic, diastolic, mean), temperature or ΔT or blood temperature, $EtCO_2$, $tcPO_2$, $tcPCO_2$, SpO_2, ST level, FiO_2, CO, CCO, respirator, anesthetic gas, BIS, $S\bar{v}O_2$, Flow/Paw, N_2O, O_2, agent, others depending on the connected bedside monitor or transmitter

Sound

Synchronization source	ECG
Alarm sound	Crisis, Warning, Advisory
Sound volume	changeable for Heart rate sync mark and sound

Alarm Function

Alarm decision is done at each bedside monitor and multiple patient receiver. The central monitor only displays the alarm and generates sound by receiving the alarm information from bedside monitors and multiple patient receivers.

Alarm type	Crisis, Warning, Advisory	
Alarm items	Vital Sign:	Heart rate, VPC rate, Respiration rate, Pulse rate, ST level, BP (sys, dia, mean), NIBP (sys, dia, mean), temperature or ΔT or blood temperature, $EtCO_2$, $tcPO_2$, $tcPCO_2$, SpO_2, FiO_2, CCO, others depending on the connected bedside monitor or transmitter

	Arrhythmia:	ASYSTOLE, V FIB, V TACHY, EXT TACHY, EXT BRADY, VPC RUN, COUPLET, MULTI FORM, EARLY VPC, BIGEMINY, TACHY, BRADY, PROLONGED RR, FREQ. VPC
	Apnea	
Alarm display	Highlighted numeric display, highlighted message for arrhythmia	
Alarm occurrence	Alarm occurs when any one of the bedside monitors that the central monitor are monitoring generates alarm.	
Alarm suspend	Available (for beds connected via the QI-910R interface)	
Alarm silence	Available (except for beds connected via the QI-910R interface)	
Alarm recording	Available	

Trend

Trend parameters	Depends on the connected bedside monitor or transmitter
Trend display times	1, 8, 24, 72 h
Trend display formats	Trendgraph and tabular trend
Events related to trendgraph	ASYSTOLE, V FIB, V TACHY, VPC RUN, COUPLET, Off/Noise

Waveform Sensitivity

ECG display sensitivity	×1/4, ×1/2, ×3/4, ×1, ×1.5, ×2, ×4
Respiration curve sensitivity	×1/4, ×1/2, ×3/4, ×1, ×1.5, ×2, ×4
BP display scale (mmHg)	0-20, 0-50, 0-100, 0-200, 50-200, 50-250, 0-300 mmHg

Overview

Displays user-selectable vital signs, up to 12 ECG waveforms, trend data, alarm events, and status messages associated with the selected overview bed.
The overview bed can be any bed in the network that the central monitor is not continuously monitoring.

Remote Setting

Alarm setting of bedside monitors and multiple patient receivers
Individual setting of bedside monitors and multiple patient receivers
Channel setting of multiple patient receivers

Full Disclosure

Saves 72 hours of full disclosure waveform data for up to six waveforms and displays them on the Full Disclosure window.
(When the QP-973P Full Disclosure Filing Program Kit is installed.)

File Saving

Trend
Arrythmia recall file
Hemodynamic data list
ST recall

Full disclosure data (only when the QP-973P Full Disclosure Filing Program Kit is installed.)
ECG 12 Lead analysis result filing (only when the QP-974P 12 Lead ECG Interpretation Filing Program Kit is installed.)
Caliper data
Alarm History

2-ch recorder, WS-971R (option)

Recording method	Thermal array recording
Number of channels	2
Recording paper	50 mm width (FQW50-3-100)
Paper speed	25 mm/s
Printed items	Patient information, date and time, waveform and measurement data, record type, paper speed

Record type

Manual recording:	Delayed waveform recording, Freeze recording, Dual delayed waveform recording, Dual delayed waveform freeze recording, Arrhythmia recall recording, ST recall recording, Expanded full disclosure waveform recording
Automatic recording:	Periodic recording, Alarm recording

Call recording
Remote delayed waveform recording

Laser Printer (local purchase)

Paper size	A4/Letter

Record type

Manual recording:	Multi-Wave printing, Multi-Wave Freeze printing, ECG 12 Lead printing, Trendgraph printing, Tabular Trend printing, Arrhythmia Recall recording, Hemodynamics List printing, ST Recall recording (ST recall files with printing mark), Full Disclosure Waveform printing, Expanded Full Disclosure Waveform printing, ECG 12 Lead Analysis Result printing, Report printing

Power Requirements

MU-971RA/RJ/RK Main Unit

Line voltage	AC 100 to 240 V ± 10%
Line frequency	50 or 60 Hz
Power consumption	AC 230 VA or less

VL-971R/RK LCD Unit

Line voltage	AC 100 to 240 V ± 10%
Line frequency	50 or 60 Hz
Power consumption	AC 150 VA or less

Environment

Operating temperature	10 to 35°C
Operating humidity	30% to 80% (no condensing)
Operating atmospheric pressure	70 to 106 kPa
Storage temperature	–20 to +60°C
Storage humidity	20% to 90% (no condensing)
Storage atmospheric pressure	70 to 106 kPa

Electromagnetic Compatibility

MU-971RJ/RK main unit:	EMI	EN55022 C Class B
	Immunity	EN55024 1998
VL-971R/RK LCD Unit	IEC 60601-1-2 1993	

Safety

MU-971RA/RJ/RK main unit

Safety standard	IEC 60950 3rd Ed.
Type of protection against electric shock	Class I
Degree of protection against electric shock	Type B applied parts
Degree of protection against harmful ingress of water	IPX0 (ordinary equipment)
Degree of safety of application in the presence of a flammable anaesthetic mixture with air, oxygen or nitrous oxide	Not suitable for use in the presence of a flammable anaesthetic mixture with air, oxygen or nitrous oxide
Mode of operation:	Continuous operation
Equipment types (classification)	Indoor stationary equipment

VL-971R/RK LCD Unit

Safety standard	IEC 60601-1 1995
Type of protection against electric shock	Class I
Degree of protection against electric shock	Type B applied parts
Degree of protection against harmful ingress of water	IPX1
Degree of safety of application in the presence of a flammable anaesthetic mixture with air, oxygen or nitrous oxide	Not suitable for use in the presence of a flammable anaesthetic mixture with air, oxygen or nitrous oxide
Mode of operation:	Continuous operation

Dimensions and Weight

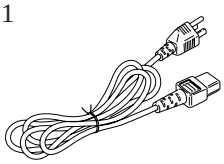
Main unit	180 (W) × 352 (H) × 405 (D) mm, approx.16 kg
LCD unit (without protrusion)	457 (W) × 472 (H) × 247 (D) mm, approx.11 kg

Standard Accessories

NOTE

- **Use only Nihon Kohden specified parts and accessories to assure maximum performance from your instrument.**
- **When ordering the following accessories, specify the supply code no. When the supply code no. is not provided with the accessory, specify the code no.**

MU-971RJ Main Unit

1 

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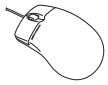
3 

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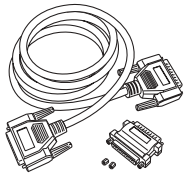
5 

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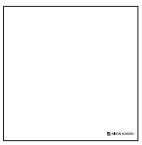
7 

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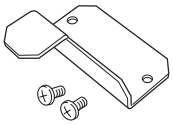
9 

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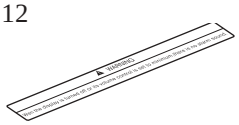
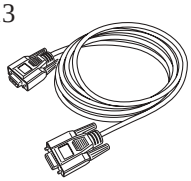
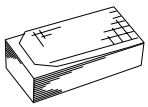
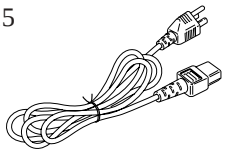
12 

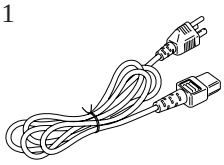
13 

14 

15 

No.	Name	Qty	Code no.	Supply code no.
1.	Power cord (PC accessory)	1	---	---
2.	Keyboard	1	---	---
3.	Mouse	1	551084A	---
4.	Windows 2000 CD-ROM	1	---	---
5.	Protection key	1	---	---
	Connection cable for protection key	1	636607	---
	Hex nut for protection key	1 (2/pkg)	636857	---
6.	Power switch cover	1	6143-012238	---
7.	Wiping cloth	1	134614A	---
8.	Sound cable	1	636616	---
9.	Sound cable bracket	1	6114-126054A	---
	Screw (unified coarse thread series)	2	636572	---
10.	LCD cable clamp	1	637188	---
	M4 binding head screw	1	---	---
11.	NIHON KOHDEN label for LCD	1	6124-032653	---
12.	LCD warning label	1	6124-036827	---
13.	Recorder cable	1	636581	---
14.	Recording paper	1	FQW50-3-100	A723
15.	Power cord W	1	094568	L945

MU-971RK Main Unit

1 

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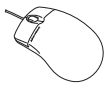
3 

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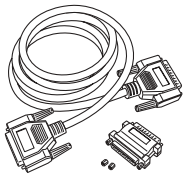
5 

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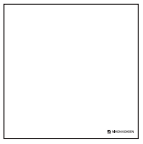
7 

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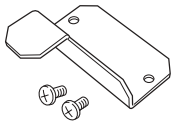
9 

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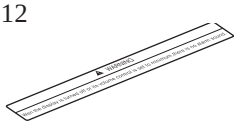
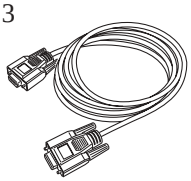
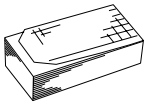
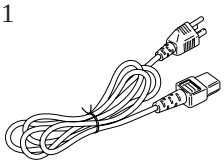
12 

13 

14 

NO.	Name	Qty	Code no.	Supply code no.
1.	Power cord N	2	314839B	L936
2.	Keyboard	1	---	---
3.	Mouse	1	551084A	---
4.	Windows 2000 CD-ROM	1	---	---
5.	Protection key	1	---	---
	Connection cable for protection key	1	636607	---
	Hex nut for protection key	1 (2/pkg)	636857	---
6.	Power switch cover	1	6143-012238	---
7.	Wiping cloth	1	134614A	---
8.	Sound cable	1	636616	---
9.	Sound cable bracket	1	6114-126054A	---
	Screw (unified coarse thread series)	2	636572	---
10.	LCD cable clamp	1	637188	---
	M4 binding head screw	1	---	---
11.	NIHON KOHDEN label for LCD	1	6124-032653	---
12.	LCD warning label	1	6124-036827	---
13.	Recorder cable	1	636581	---
14.	Recording paper	1	FQW50-3-100	A723

MU-971RA Main Unit

1 

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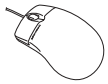
3 

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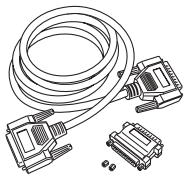
5 

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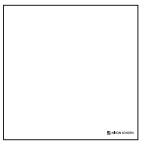
7 

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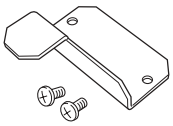
9 

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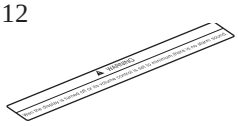
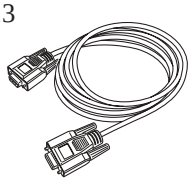
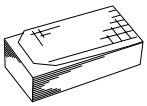
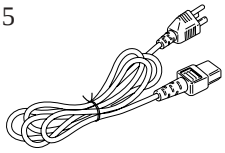
12 

13 

14 

15 

No.	Name	Qty	Code no.	Supply code no.
1.	Power cord (PC accessory)	1	---	---
2.	Keyboard	1	---	---
3.	Mouse	1	551084A	---
4.	Windows 2000 CD-ROM	1	---	---
5.	Protection key	1	---	---
	Connection cable for protection key	1	636607	---
	Hex nut for protection key	1 (2/pkg)	636857	---
6.	Power switch cover	1	6143-012238	---
7.	Wiping cloth	1	134614A	---
8.	Sound cable	1	636616	---
9.	Sound cable bracket	1	6114-126054A	---
	Screw (unified coarse thread series)	2	636572	---
10.	LCD cable clamp	1	637188	---
	M4 binding head screw	1	---	---
11.	NIHON KOHDEN label for LCD	1	6124-032653	---
12.	LCD warning label	1	6124-036827	---
13.	Recorder cable	1	636581	---
14.	Recording paper	1	FQW50-3-100	A723
15.	Power cord UL	1	505312	L945

Options and Consumables

Options

Name	Model	Qty
LCD unit	VL-971R	1
LCD unit	VL-971RK	1
Recorder unit	WS-971R	1
12 Patient Expansion Program Kit	QP-971P	1
16 Patient Expansion Program Kit	QP-972P	1
Full Disclosure Filing Program Kit	QP-973P	1
12 Lead ECG Interpretation Filing Program Kit	QP-974P	1

Consumables

Name	Qty	Model	Supply code no.
Recording paper	1	FQW50-3-100	A723

General Requirements for Connecting Medical Electrical System

When more than one electrical instrument is used, there may be electrical potential difference between the instruments. Potential difference between instruments may cause current to flow to the patient connected to the instruments, resulting in electrical shock (micro shock). Therefore, electrical instruments must be appropriately installed as specified in IEC 60601-1-1.

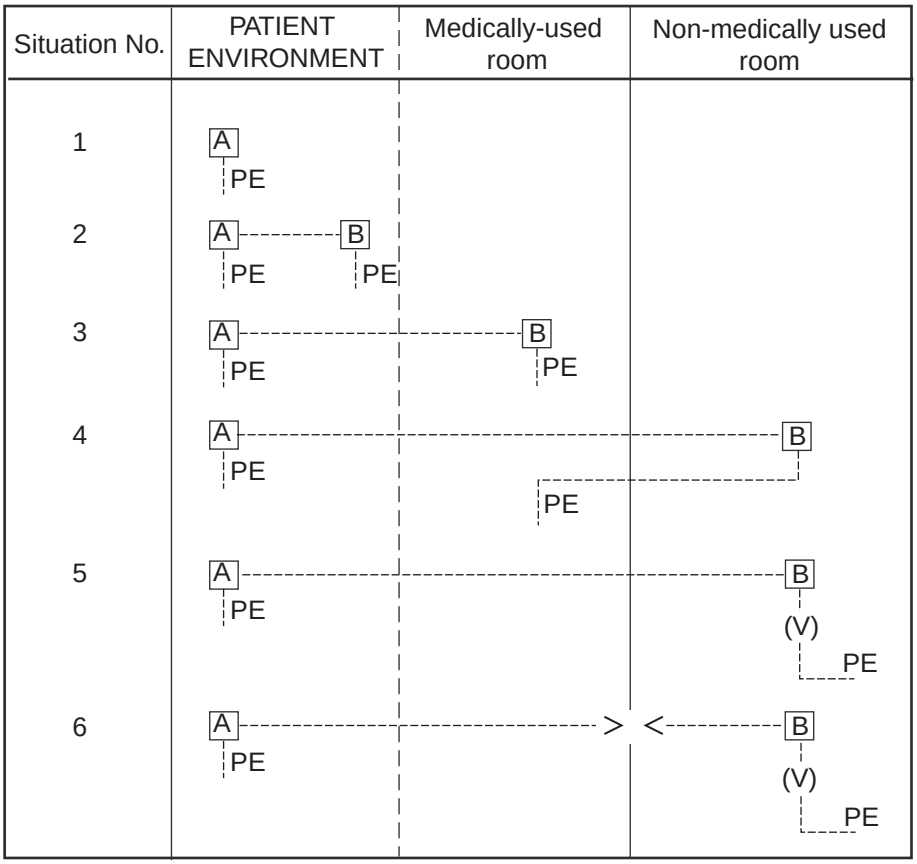
The following is an extract from IEC 60601-1-1 “Medical electrical equipment Part 1: General requirements for safety”. For details, refer to IEC 60601-1-1 and consult with a biomedical engineer.

Examples of combinations of MEDICAL ELECTRICAL EQUIPMENT and non-medical electrical equipment

Situation No.	Equipment A	Equipment B	Solution
1	IEC 60601/X		OK
1a	IEC XXXXX		OK, if ENCLOSURE LEAKAGE CURRENT is less than 0.5 mA. If the ENCLOSURE LEAKAGE CURRENT is more than 0.5 mA: Solution *Q* (separating transformers).
2a	IEC 60601/X	IEC 60601/B	OK
2b	IEC 60601/F	IEC XXXXX	for B any one of *P, Q, R*
2c	IEC 60601/B	IEC XXXXX	for A solution *P* for B any one of *P, Q, R*
3a	IEC 60601/X	IEC 60601/B	OK
3b	IEC 60601/F	IEC XXXXX	OK
3c	IEC 60601/B	IEC XXXXX	for A solution *P*
4	See 3a, 3b, 3c		
5a	IEC 60601/X	IEC 60601/B	for A solution *P* or *S* (groundloop possible)
5b	IEC 60601/X	IEC XXXXX	for A solution *P* or *S* (groundloop possible)
6a	IEC 60601/X	IEC 60601/X	OK (with *S*)
6b	IEC 60601/X	IEC XXXXX	OK (with *S*)

IEC 60601/B = IEC 60601-1 EQUIPMENT of TYPE B **with** PATIENT connection
IEC 60601/F = IEC 60601-1 EQUIPMENT of TYPE BF or TYPE CF (or TYPE B **without** PATIENT connection)
IEC 60601/X = IEC 60601-1 EQUIPMENT of TYPE B or TYPE BF or TYPE CF
IEC XXXXX = Equipment complying with e.g. IEC 348, IEC 950 etc.

P: additional protective earth
Q: additional separating transformer
R: floating power supply
S: separation



Legend:

(V) = Potential difference between different localities.

> < = SEPARATION DEVICE.

PE = Protective earth.